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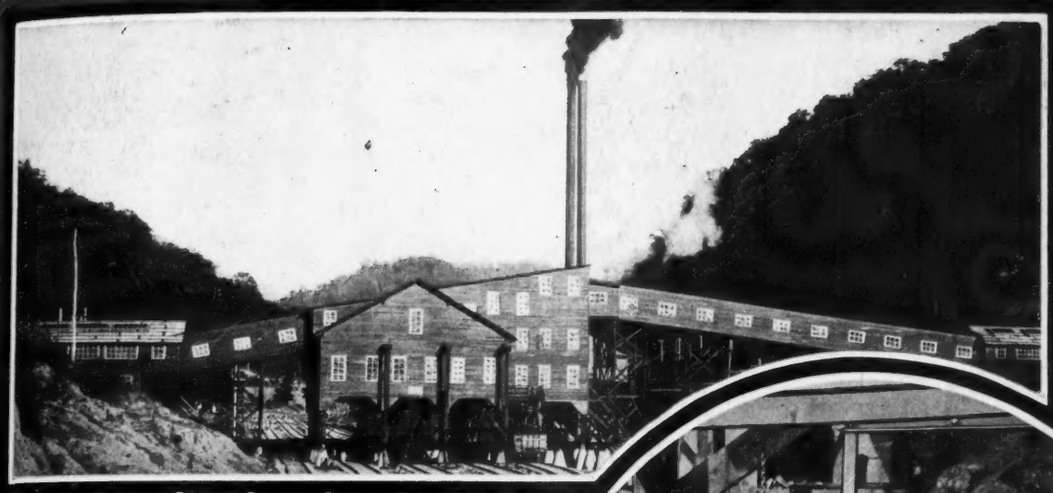

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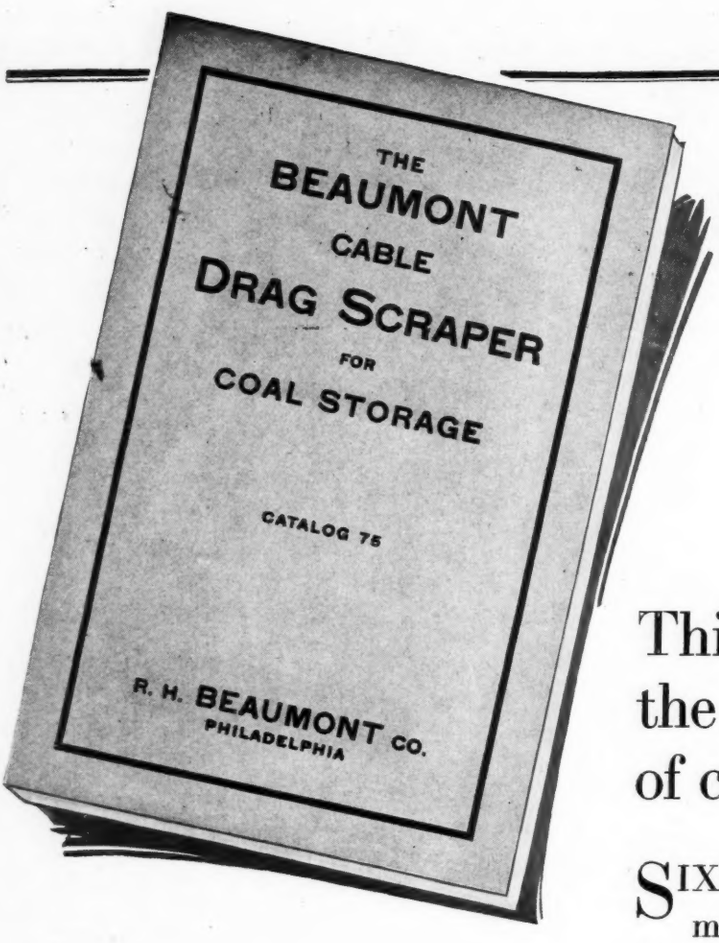

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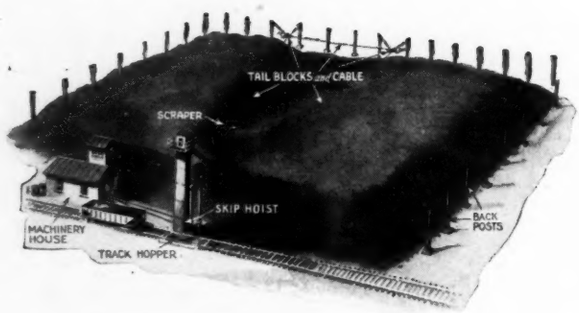

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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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Meeting the Labor Question Nationally

SIX years ago coal operators from all over the country met for the first time in one assembly. In the autumn of 1917 the National Coal Association was organized and its first year was given wholeheartedly to winning the war. Next week its seventh annual convention will be celebrated at Atlantic City. Much has transpired since the end of the war.

Its war job done, the association early in 1919 turned to the assembly and dissemination of trade facts as one of its chief functions. A federation of local trade bureaus, the National organized a country-wide trade-reporting service that functioned well until the federal government put the ban on open price reporting. Since the strike of 1919 the National Coal Association has been mainly engaged in fighting for the maintenance of the coal business as a private enterprise. Its activities have been more political than economic and it may be said that it has been the recognition of Washington in the scheme of things affecting the coal man that has held the organization together through some trying periods. Incidentally it is apparent that this recognition and consequent interest in and support of the National Coal Association has varied almost directly as the distance from the national capital.

Last year, in the second month of the great strike, labor was boldly admitted as a subject that could be considered by the membership of this association. Distance from Washington—or from Indianapolis, for that matter—does not serve to cool the interest of every coal operator in labor. Everyone has it on his mind; if union, how to get along with the union, and if non-union, how to maintain that status. Thus the subject that is uppermost in the mind of each was no longer banned from the councils of the National Coal Association. True, the severity of the strike and the lack of ability of even the union operators to meet on any common ground prevented the National Coal Association from becoming a factor in the labor situation; in fact precluded it from opening the matter for discussion.

Thus we find at the beginning of its eighth year a national association composed largely of local groups that have as their chief, and in many instances their only, function the handling of labor matters. The labor policy of the national organization as expressed at the convention last year is to recognize and respect the rights and opinions of the locals on labor matters, to interfere in no way with the principle of "district autonomy." Such a policy aims in no way to give direction to thinking or action on labor matters. Its expression helped in no way to solve labor questions and but served to spread on the record what has always been the opinion of the membership.

The sentiment of a majority of the coal operators is still to maintain the National as a defender of the rights of individual action. They are even yet engaged in writing and defending their declaration of independence. Some day, surely, they will think about writing a constitution that will bind them together in progressive movement. It is not to be thought that no one of them has given this matter consideration, for the past year has emphasized to the leaders the necessity of a plan of action that will overcome the handicaps to the industry imposed by an uncemented two-thirds unionized majority and a solid one-third non-union group.

Not once but many times in the past few years has the question been raised, How long will the National Coal Association live? The answer is that it is here to stay. When last year defection of large union groups —Illnois, central Pennsylvania and Iowa and the largest operator in Pittsburgh—reduced the ranks, it seemed that the organization was drifting into the control of the non-union producers. The end in that direction would be fatal to the National, as everyone knows. The tendency has been unduly magnified, however, for the union operators who have remained with the organization have been working steadily toward consolidation of their ranks and the working out of a policy that will reunite the whole. Time for education must be allowed for this accomplishment.

Granted that the main purpose of this association remains the perpetuation of the right of individual enterprise in the coal industry, it were well to recognize that, unsatisfactory labor relations being the chief cause of disturbance and the root trouble, to correct this condition might well become the chief activity of the National. That is to say, correction of the cause of trouble is in the end more constructive than defence against the effects. Nevertheless a defensive alliance has served the useful purpose of holding the ranks together while education has been proceeding on other lines.

This education has advanced sufficiently to warrant the National in stepping forward beyond the mere assertion of the desires of local interest, the preservation of "district autonomy," to a definite alignment that is designed to carry forward that policy. As a program, a common ground for union and non-union operators within the association, a policy of maintaining the *status quo* is sufficient, but for the union operators something more is essential. Within the National if possible, otherwise outside, there is required a grouping of those who must meet the union sufficiently strong, aggressive, cohesive and purposeful to combat a united militant United Mine Workers. Save by the example of their unity of purpose and unity of action the non-union operators can lend the union producers no help in this. The problem is for those who are dealing with organized labor. That is why the well wishers of the National Coal Association, who outnumber the present membership, look forward to the return to active participation of those who are temporarily outside, believing that when a formula has been devised for meeting the labor question unitedly the National Coal Association will be but at the threshold of its greatest usefulness and success.

The Anthracite Market

THERE is a danger signal for the country in the unseasonable strength of the anthracite market. Domestic sizes are in such strong demand that independent quotations, the index of activity, have barely fallen from their winter's peak. In fact, quotations on scattered lots of pea and larger coal recently have set unusual records for this time of the year and the bulk of the independent coal is moving at a differential of a dollar over company coal. Normally April and May are comparatively dull months for the independents; their prices sag and movement declines with the coming of winter and the beginning of a new coal year.

Two things have combined to make this season out of the ordinary, aside from the fact that the city dweller is quite generally in funds and able and willing to buy almost irrespective of price. Probably first and foremost is the fact that the East squirmed its way through last winter on curb-to-furnace deliveries. No surplus of hard coal was at any time possible and bins were empty at the end of a long, cold winter and spring. Retail dealers have sought to replenish their yard supplies and have almost without exception found householders willing if not eager to take in next winter's requirements. The flow from mine to cellar has been uninterrupted.

Overhanging strike clouds are again making apprehensive the householder and particularly the trade. The wage contract between operators and mine workers in the hard-coal region will expire on Aug. 31. Will it be renewed without a suspension? No move is being taken to negotiate a new contract, and none is possible until after the mine workers' tri-district convention which is to meet on June 26 to formulate policy and demands. It is generally expected that the demands of 1922 will be restated, calling for 20 per cent increase in wages and for changes in working conditions that are calculated further to increase the cost of production.

The consumer is convinced in advance that his anthracite is costing too much. He will have no patience with a higher price although the majority of users will pay for a time—but under protest—whatever the price may be. So far has anthracite traveled the road toward the category of luxuries. The producers know the outcry that would follow a jump in price and will contend against the demands of the workers for higher wages.

Several unknown factors intervene in estimating the extreme to which the United Mine Workers may go in holding out for the increase it seems assured they will formally demand. One is the strength the radical movement among the workers may develop—that is to say, to what extent a conservative leadership may be able to control the men. Conservative leadership, opposed to nationalization and favoring the well-trodden paths of collective bargaining, may be able to read aright the signs of the times and come to a peaceful understanding with the anthracite operators, one not colored by a concurrent soft-coal settlement. This, we believe, is hoping for a great deal. What the undoubtedly strong radical element, Cappellini on the outside—as yet—and Golden on the inside, may accomplish is another matter. One does not need to be a pessimist to anticipate at least unsettled labor conditions in the anthracite region this year.

Unknown also are the facts about anthracite that the U. S. Coal Commission will release to the public on July 1, the date set by Congress for a special report, it seems in aid of the very situation that is developing. And what effect will the publication of the results of an impartial detailed investigation of the many moot points have on a restive, suspicious public and on operators and mine workers? Will the findings of fact and interpretation of the Coal Commissioners so definitely point the several ways that there will be no gainsaying the ultimate direction of action?

Uncertainty lurks at every turn. Between now and Sept. 1 is less than three months in which to take in anthracite. There is no complaint of the rate at which household coal is pouring into the consumer's cellar, but there is too little heed to the accumulations now, under quite favorable price and market condition, of substitutes. It were well that the advice be discreetly passed to the public that it is taking too many chances if it puts entire trust in getting hard coal easily next winter. Some judicious buying of substitutes in the next few months would be good policy for all.

A Daniels Come to Judgment

FINAL disposition last month by the U. S. Supreme Court of the New River Collieries case sets at rest all doubt as to the legal right of a seller to demand the market price for his coal. Even before the Lever act the Navy Department set its own price for the coal it commandeered or bought and invited the producer to accept that price or fight in the courts. After the government prices were lifted and until early in 1921 the same policy was followed. The test case for the producers was won in the lower courts and now is upheld in the highest court in a unanimous decision that contains a number of interesting and important statements.

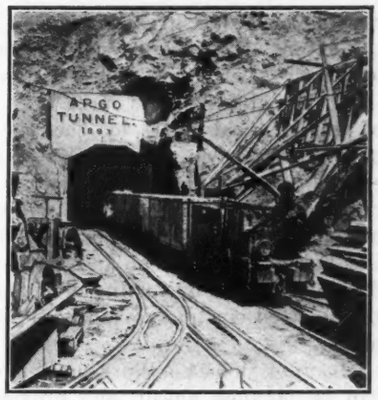
The ascertainment of compensation, it is stated, "is a judicial function, and no power exists in any other department of the government to declare what the compensation shall be or to prescribe any binding rule in that regard." That is, whether it be coal or coal mines, the courts will decide what price shall be paid if the government becomes the buyer. "Where private property is taken for public use, and there is a market price prevailing at the time and place of the taking, that price is just compensation." The refusal of lower courts to consider evidence on the owner's cost of production and a reasonable profit was upheld because the "owner's cost, profit or loss did not tend to prove market price or value at the time of taking, and was therefore immaterial."

The distinction was recognized between contract prices under which coal was currently moving in domestic business and the spot market on which the coal commandeered was being sold.

WHEN AS RECENTLY AS JAN. 29 Ellis Searles repudiated the nationalization plan of Brophy and Golden, he pointed out that Brophy's committee was not authorized to present its findings save to the next convention of the U.M.W.A. Brophy, reputed to be after John Lewis' scalp, was thus spanked. Now comes the proposal of the three anthracite district presidents, signed by none less than Ellis Searles, outlining a plan for nationalization of the hard-coal mines. It is now Brophy's turn to point out in Searles' words that "the 1921 convention did not commit the union to any particular form or plan of nationalization."

Coal- and Metal-Mining Methods Contrasted

By D. Harrington
Supervising Mining Engineer, U. S. Bureau of Mines



High Temperatures in Metal Mines—Methane Found in Workings of Both Types—Blasting Timber Causes Fires in Mines Producing Metals—Dust in Such Mines Probably Causes More Deaths Than Coal-Dust Explosions

THE products of the mineral industry of the United States were worth four billions of dollars in 1921 (the latest year for which figures are available), of which coal accounted for one and three-quarter billions and virgin metals for three-quarters of a billion, so a general comparison of practices at coal and metal mines should be instructive.

Natural Conditions.—In general the coal mined in the United States is less than 1,000 ft. below the surface vertically and the mining is all on one plane, usually tilted only slightly from the horizontal, though there are a few coal mines with over 2,000 ft. of cover, and a considerable number with steep pitches or working two or more seams. Metal mines generally work along several practically vertical horizons, and frequently have workings 3,000, 4,000 or even 5,000 ft. below the surface.

In this connection it is noticeable that ladders are only occasionally found in coal mines, and few coal miners are proficient ladder climbers. The natural temperature of surrounding walls or of water encountered in coal mines runs from about 50 to 70 deg. F., with rare instances where the wall temperatures are over 70 deg. and in places will reach as high as 90 deg. F. The natural wall temperatures in metal mines, while generally low near the surface, run as high as 135 deg. in deep workings, and in mines with fires, such temperatures may frequently approach 200 deg. F. Largely owing to the conditions recited, the air temperatures in working places in coal mines rarely rise above 70 deg. F., whereas temperatures of 80, 90 or well over 100 deg. F. frequently are found in the working places of metal mines.

Gases Encountered.—Many coal mines are afflicted with methane and occasionally coal mines are troubled with small outflows of nitrogen or sulphuretted hydrogen. In unventilated places, the percentage of oxygen may fall below normal, that gas being absorbed by the coal. Metal mines also occasionally emit methane and in many regions they also are troubled with sulphuretted hydrogen, carbon dioxide, or nitrogen which is emitted by the strata. Frequently, moreover, there is a dangerous oxygen deficiency due to the absorption of that gas by timbers or as the result of the oxidation of ores.

Besides these gases from natural causes may be found carbon monoxide. This occurs both in coal and metal mines, being the outcome of mine fires. Metal-mine fires also give off dangerous quantities of sulphur dioxide, fumes of dilute sulphuric acid, and even arsenical fumes. Moreover, in metal mines the firing of shots loaded with dynamite in confined and poorly ventilated places frequently leaves those places filled with dangerous percentages of carbon monoxide and oxides of nitrogen. Fatal gassing from this source is much more frequent in metal than in coal mining. In fact, metal mines as a whole have a much greater variety of dangerous gases than coal mines.

The coal miner usually is more or less familiar with gases and is disinclined to venture into abandoned workings unless they have been inspected by a fireboss. On the other hand, metal miners—even the men in charge—rarely have much knowledge of the possible pollution of the mine atmosphere, and the belief is general that so long as a candle continues to burn, the miner is safe, notwithstanding the fact that a candle may burn brightly when the surrounding air contains sufficient poisonous gas, such as carbon monoxide or oxides of nitrogen, to cause almost immediate death to persons breathing it.

Blasting Timber Causes Metal-Mine Fires

Fires.—Fires in metal mines have been caused by the spontaneous combustion of manure, by the ignition of hay, timber, or similar combustible material, by candles or matches, by the short-circuiting of electric wires, by the blasting of timber, by the use of fuse and dynamite in the vicinity of timber and by other causes. In the past, most metal-mine fires were started by the careless handling of candles, but the recent displacement of that means of illumination by the

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Note—Published by permission of the Director, U. S. Bureau of Mines. These notes are presented as embodying personal impressions of coal and metal mining after twenty-two years of experience and observations wholly in the United States, about fifteen years being spent in coal mining and seven years in connection with metal mining, during which underground work has been done or trips taken into working places in over 150 coal mines in fifteen states of the Union, and in over 100 metal mines in fourteen states. The ground covered included twenty-five states—as far east as Virginia, as far north as Montana, and as far south as Alabama, eleven states being east of the Mississippi. Only two short trips were taken into anthracite mines, hence anthracite conditions are not included. The metal mines visited included those whose chief product was copper, gold, iron, lead, manganese, silver, tungsten or zinc.

The illustrations and captions were added by the editor without consultation with the author.

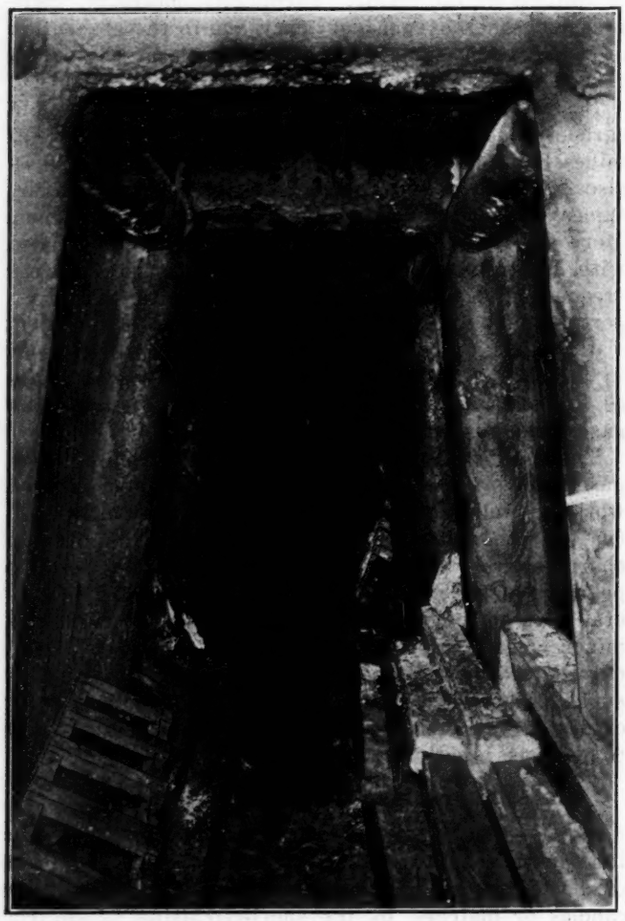
The headpiece depicts the Argo tunnel. Home-built locomotive, bringing out a load of 3-ton ore cars on a 36-in. gage. These are typical ore cars without flare, of narrow gage and of steel construction. Flare is less necessary where the mineral is heavy and the support of a flare also is more difficult under these circumstances.

carbide lamp has greatly reduced the fire risk, though the extension in the use of electricity for fans, pumps, locomotives, etc., has added a new hazard.

Most coal-mine fires have been caused by ignitions of gas or coal dust, by the use of dynamite, black powder and open lights. Fires also are occasionally caused by spontaneous ignition or the ignition of timber due to defective electric wiring. In general, coal-mine fires are extinguished by sealing or loading out the hot material—coal and slate—whereas metal-mine fires are put out by sealing or flooding, the latter method being used in metal more frequently than in coal mines.

Opening Mines.—Workings in coal mines generally can be planned ahead, and provision made for future requirements as to ventilation, haulage, etc. Immediately upon opening, intake and return aircourses are started, and underground workings are driven in duplicate, triplicate, etc., so as to provide for the circulation of air, and at the same time to afford more exits than one in case of a fire or a cave-in.

On the other hand, only infrequently can workings in metal mines be planned ahead, owing to the uncertainty as to the location, continuity or persistence of the ore deposits. As a result, usually but one opening is made into metal-bearing property until its ore bodies are well proved; and underground openings generally are driven singly. Hence it is difficult, in fact almost impossible, to provide adequate air circulation or even adequate protection to workers in case of cave-in or fire.



GUNITED TIMBER IN A CROSSCUT AT BUTTE

Anyone who notes this timbering will realize the fact that metal timbermen are, and must be, superior to those in coal mines. These timbers are some of the few being gunited in metal mines to preserve them from rot. This preservation it effectually affords. The narrow, badly cluttered roadways are a danger which would be greater were the crosscuts driven on a steep grade. Being level, and the car trips being short, the danger is somewhat reduced.

As a consequence, many metal mines have but one opening and are extremely unhealthy and dangerous places in which to work. Workings in coal mines frequently have their height determined by the thickness of the coal seam, and where a seam is 3½ to 5 ft. in thickness, the employees are bent over when walking or working, a condition seldom found in metal mines and one which the metal miner resents when he does encounter it.

Development.—The room-and-pillar system of coal mining roughly resembles the various stoping systems in metal mining. Some real room-and-pillar work is done also in metal mining. The caving systems therein, moreover, somewhat resemble the longwall method in coal mines. In general, the excavations are more frequently back-filled in metal than in coal mines, and the percentage of extraction from the original deposit in metal mining is far better than in coal mining. The strip pit in coal mining is similar to the steam-shovel methods on iron and copper deposits.

The "room" in coal mining is essentially the "stope" in metal mining, and the coal-mine "entry" corresponds to the metal-mine "drift," a "crosscut" in a coal mine is a short connection between two entries, or two rooms and is driven, in general, wholly in the coal; the word "crosscut" in metal mining usually is used to denominate an underground level which is driven in the country rock to intersect a vein. It is not used to designate a passageway driven in ore. The coal miner's "roof," or "top," is the metal miner's "back," and the "rib" of a room or entry in coal mining is the same as the "side" or "wall" which the metal miner leaves in driving his stope or his drift.

Ventilation.—The planning of ventilating systems is done largely before steps are taken toward the actual opening of coal mines, whereas many metal mines never have a ventilating system, and the few that do, install one only upon necessity. Many of the main fans in metal mines are placed underground, but to put a main fan underground in a coal mine would be a criminal absurdity, and no state law would allow it. As heretofore indicated, coal-mine openings are driven in pairs to allow of one opening for intake air and another for return air, and state laws generally require moving currents at all working faces.

Only rarely are metal-mine workings driven in pairs, and not 25 per cent of the working faces therein have air with perceptible circulation. Coal mines use overcasts, brattice cloth, air regulators, etc., to deflect air currents, but these are almost unknown in metal mines. Though the use of electrically driven fans underground as "boosters" is generally condemned in coal mines, it is a sign of progressiveness in metal mines.

The placing and use of numerous doors is good practice in metal mining but poor practice in coal mines, especially those which are gaseous. Ventilating doors in metal mines usually are flimsily constructed and maintained, whereas the doors in coal mines generally are fairly well-constructed and kept in good repair.

Lighting.—In general, metal-mining companies have been accustomed to supply lights for underground workers, whereas coal miners have paid for their own lighting. The candle so long supplied by the companies and used by the metal miner has not been used by the coal miner, largely because the air currents provided in coal mines would extinguish the candle flame.

SUPPORTING A MINE "BACK" WITH TIMBER

The "back" is the hanging wall of the vein, which is not stratified in the same direction as the mineral is lying. The country rock may be level while the vein is at a steep vertical angle. Moreover, the volcanic matter often has weakened the walls of the passage that it has made for itself, and the back consequently is dangerous like the roof above coal beds.

On the other hand, the old-time coal miner's oil-lamp could not be used in metal mines because, owing to the deficient ventilation in 90 per cent of the working places, the smoke it would cause would drive the men out. At present, where open lights are allowed, both coal and metal miners use carbide (acetylene) lamps, the coal miner buying both lamp and carbide. In general, the metal miner buys his lamp (usually from the company and at cost), the company supplying the carbide. In coal mines the carbide cap lamp is used almost exclusively, but some metal miners use this type of lamp and others a carbide lamp with a candlestick attachment. Many coal mines—both gaseous and non-gaseous—require miners to use electric safety lamps owned and maintained by the company, with rental charged the miners; but, as far as my observation goes, none of these electric safety lamps is yet used in metal mines, though their use would do much to eliminate fires.

Explosives and Blasting.—In metal mining magazines for explosives usually are placed underground, but this would be criminal in a coal mine. No coal miner would think of firing a shot without having inserted previously and firmly tamped some stemming material, whereas the metal miner often puts nothing in his blasting hole but straight explosive, frequently inserting a few extra sticks as stemming. However, there is increasing use of inert stemming among progressive and efficient metal miners.

The coal miner generally buys his own explosive and consequently is quite willing to use stemming. As the metal miner usually is furnished with explosive by the company which employs him, he sees no reason to go to the exertion of finding inert stemming. To save explosives and to decrease the proportion of fines shot down, the coal miner frequently undercuts the working face and then fires an opening or "buster" shot, delaying the other shots until the material shot down from the latter has been removed.

On the other hand, the metal miner does no undercutting, and though he fires his "cuts" (corresponding to "busters" in coal mining) first, usually he has provided to have the lifters blasted a few seconds later. These are heavily charged so as to throw material away from the face, all shots generally being loaded in such manner as to produce a maximum of fines.

Coal miners generally use black blasting powder, and occasionally 30 to 40 per cent dynamite; but in recent years dynamite, and to a certain extent black powder, has been superseded by permissible explosives, many of which are a modified dynamite with shorter and cooler flame and less violent action. The metal miner rarely, if ever, uses black powder, except in open-pit work.

Experiments with permissible explosives are being made in the hope that the number of fires in metal mines resulting from the blasting of timber may be reduced. It is hoped that, in a similar manner, accidents will be made less frequent in open-pit work. To use a mixed charge of explosive, such as two grades in a hole, is a dangerous practice when coal is the mineral being extracted, because gas or dust may be ignited by the successive flames due to different rates of detonation. On the other hand, the use of two grades of explosive in a metal mine is recommended as a means of obtaining additional strength of detonation. For instance a stick or two of 60-per cent gelatin may be used as a primer in a charge with several other sticks of 40-per cent strength. Material is more often shot by electricity in coal than in metal mines, the metal miner, even in shaft-sinking, generally preferring to use fuse to which he is accustomed rather than to change his habits of years and adopt a much safer practice.

Drilling.—Ability to drill holes with compressed-air machine drills determines largely the degree of proficiency of the metal miner, and air-compressors are an indispensable part of the metal-mine equipment; but in coal mining, drilling ordinarily is done by hand-operated machines and is a comparatively unimportant side issue. (In recent years in some mines the coal has been drilled by electric machines.) Compressed air rarely is available at a coal mine, especially since the electrically driven undercutting machines have displaced the puncher undercutter.

Tools.—The metal-mining company generally supplies all tools, hence drills, hammers, shovels, etc., frequently find their way into the waste rock or filling, or are otherwise lost or destroyed. The coal digger generally buys his own tools, such as picks, shovels, drills, etc., and in consequence rarely loses them. The coal miner invariably uses a short-handled, square-pointed, wide-bladed shovel and a light, sharp pick. The metal miner uses a narrow-bladed shovel with the blade either round or square, generally with a long handle. Where picks are found in metal mines they usually are of large size

"CROSSCUT" IN A COLORADO MINE

A "crosscut" in metal-mine parlance is a roadway driven level from a shaft through the country rock to a mineral vein. It is not located in the mineral, being extracted in "ground" that has no value. This crosscut has been driven by hand and is extremely irregular.

and not particularly sharp. The coal company often charges the miner for sharpening picks and other tools, but this is seldom if ever the practice in metal mines.

Timbering.—Though the coal operator makes a determined effort to save timber for re-use where possible, and immediately takes up for re-use rails and ties from abandoned places—even if abandonment is but temporary—only rarely does one see an effort made to save timber in metal mining except possibly some floor lagging, and the quantity of steel rails, pipe and ties allowed to decay and rust in many of our metal mines would put the ordinary coal company into bankruptcy. Timbering in metal mines is much more systematic than in coal mines, and the metal miner is a much more efficient timberman than the coal miner.

Coal or Ore Cars.—In metal mines the cars in use almost invariably are of steel, but in coal mines they usually are of timber with steel straps, though steel cars are becoming more numerous in coal mines. Similarly, metal mines use steel rails almost exclusively, but one frequently finds wooden rails in coal mines, especially in rooms. The metal mine uses skips and skip-pockets, whereas but rarely is the skip found in coal mines, unless the coal is to be used for steaming purposes.

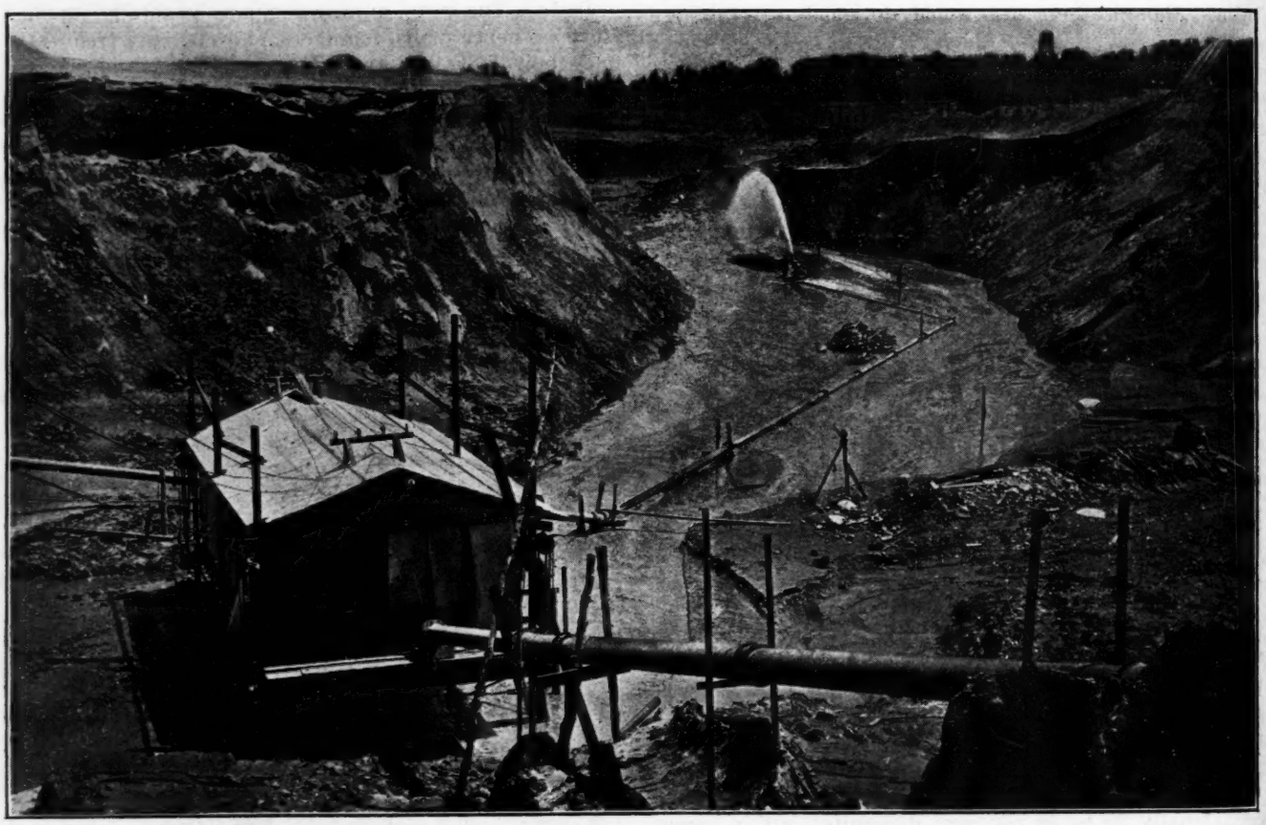
Similarly, sheet-iron turn-sheets, which are used in connection with the tramming of cars in metal mines, are seldom used in or around coal mines. In general, much larger tonnages are handled in coal than in metal mines, and haulage ordinarily is much more efficiently arranged and the track better maintained in coal than in metal mines. However, the largest average daily output from any one underground shaft in the United States comes from a metal mine. This mine produces 20,000 tons of copper ore normally whereas the largest bituminous-coal shaft hoists only 8,000 tons per day.

By intensive mining methods the metal mine obtains a much higher percentage of material from the ground than does the coal mine, which in many cases (mostly lignite mines), wastes 75 per cent or over of the original coal available. Filling after mining is done much more systematically in metal than in coal mines.

Personnel.—A daily or shift wage has predominated in metal mining, but during or toward the end of the World War, contracting or bonus and penalty systems were introduced somewhat freely in driving drifts, crosscuts and raises, in drilling holes, in setting timber, in stoping, etc. In coal mines, contracting has for years been the rule in much of the underground work, except that relating to the transportation of coal.

Wages in metal mining generally were higher that in coal mining before the war, but during and since that period the coal miners' earnings per day or per year probably will exceed those of the metal miner. Though the coal miner's employment is seasonal and more or less intermittent, he is in general assured of at least 200 days' work per year and in some years 250 or more days (if he cares to take it), and his daily remuneration is comparatively high. The metal miner works at a lower rate per day, and if business conditions are depressed, cold weather does not ensure him any work. On the other hand, when "times" are normal, the metal miner has much the more steady employment.

The proportion of English-speaking men probably is greater in metal than in coal mines, and, at least in the West, it is noticeable that there are comparatively few Japanese or Chinese in metal mines and comparatively few Irish or Finns in coal mining. Coal-mine



HYDRAULIC STRIPPING LAYS BARE THE MINERAL VALUES BELOW THE SURFACE

This is not a gold placer but an iron-ore mine. The surface is being stripped hydraulically. This practice seems as unusual in iron as in coal mining though some of this work has been done in both. The stripping shown is known as the Rowe mine and is in Crow Wing County, Minnesota, on the Cuyuna Range. Rowe is near the town of Riverton, a village located close to the Mississippi

workers are much more thoroughly organized than metal-mine workers. A somewhat peculiar condition exists at many metal mines, in that the miners (general underground workers) are unorganized, whereas certain crafts (machinists, hoisting engineers, electricians, etc.) are thoroughly organized, yet all work together in comparative harmony. The coal-miner's union includes all occupations in or around the mine, whereas around metal mines, where any group of men is organized, the various occupations, such as miners, hoistmen, machinists, and others, each have their separate organizations.

Products, Markets, Wages, Prices, Costs.—The metal-mine operator produces a commodity for which the selling price is, to a large extent, fixed. Hence there is comparatively little direct local competition, whereas each coal operator, at least up to the time of the war, negotiated his own selling price. Consequently local competition was keen. Largely as a result of these conditions, metal-mine operators could co-operate and work harmoniously.

On the other hand, while coal operators formed associations, only too frequently there was no real harmony; and even if there was peace on the surface, there was only too likely to be subsurface undercutting of prices, juggling of the sizing of coal, tampering with wage scales, etc. Notwithstanding these factors, costly litigation has been much more frequent between metal-mining companies than between coal corporations. Today, with metal prices low—that is, considering war prices and present operating costs—the metal-mine operator is anxiously trying to hold wages and all other costs to a minimum, and in doing this the lower wage fails to hold labor.

On the contrary, the public has a well-defined suspicion that coal operators have a community of interest with their employees in holding high the wages and general cost of coal, in order that the profit per ton may be held as high as possible, as it is obviously easier and much more remunerative for the coal operator to take a profit of 50c. per ton on coal, now costing about $3 per ton at the mine, than it was to take 25c. per ton on coal costing $1.50 or less per ton in pre-war times.

Moreover, with the higher wage, the coal mine attracts and holds labor, even with other work plentiful and operations at the coal mine intermittent. To be commercially available, the cost of producing coal rarely can be more than $4 per ton, and is usually under or around $3; on the other hand, the cost of producing a ton of ore may be over $20 or even over $100, and yet the operation may be profitable. The price of some metals, such as copper, is dependent largely upon foreign demand, whereas the price of coal, except in a few localities, is practically independent of foreign influences.

How Coal and Metal Miners and Engineers View One Another.—In general—at least in the past—the metal-mine employee from general manager to shoveler, considered himself much superior to corresponding grades of workers in coal mines. For instance, I have yet to encounter a metal-mining engineer who did not look with ill-concealed contempt on the coal-mining engineer, yet the latter undoubtedly has a greater number of intricate operating problems to encounter than his metal-mining brother and, in general, has much the greater record of efficiency to his credit.

Coal-mine foremen generally are disinclined to employ metal miners because they feel that the latter will "agitate" or, if employed on wages, will be inclined to "take five" (take frequent resting spells) as frequently as they had been accustomed to do in metal mines, which would be far too frequently for general coal-mining practice. Nearly all metal mines have an assayer or a chemist, or both, whereas only rarely is either found at a coal mine. Similarly, the geologist finds employment at or around a metal mine much more frequently than at a coal mine because the ore must be followed, and the veins or deposits more often than not are faulted and uncertain, whereas in this country the coal beds usually are comparatively regular and continuous, and their prospecting by drill-holes is comparatively simple.

A STOPE IN THE CALUMET & HECLA

After all a stope is nothing more than an extremely steep room. Here the stope is empty except for timber, and the men have to watch against an awkward slide. Note the scaffolds which the men have erected to aid them in using machine drills.

Safety and Health.—Notwithstanding the almost universal impression of metal-mine workers that coal mining is too dangerous for them, the annual record—especially in recent years, even when explosions from gas and dust are included—frequently indicates that there were more accidents per 1,000 men employed in metal than in coal mines, though ten or more years ago metal mining had much the better record of the two. Considering only those accidents occurring from ordinary causes (eliminating those from explosions of gas and dust) there is no doubt that the coal miner has much the safer occupation.

The decreasing accident rate in coal mining is due largely to the eliminating of explosions of gas and dust by taking advantage of our latter-day knowledge of the methods by which these major accidents may be prevented. It must not be forgotten, however, that there was what appears to have been a sort of epidemic of major coal-mine accidents late in the year 1922.

In my opinion those metal-mining companies which make a definite attempt to reduce the accident rate generally have a much more efficient organization than can be found similarly engaged at coal mines. The metal-mining company generally chooses as safety man a young, vigorous and forceful engineer who has had underground experience as shift-boss and possibly in

WATER STOPING DRILLS IN DAVIS-DALY MINE

The head of the standing driller is almost touching the "back" or the "hanging wall" of the stone. The man with the drill steel is sitting on the edge of the footwall and at his back is the mineralized material into which the drill is holing. The men's feet are on waste material, on which indeed two of the men are squatting. The use of drills is more extended in metal than in coal mines.

other capacities; whereas ordinarily the safety man at a coal mine is a foreman or superintendent incapacitated by age or physical infirmity for performance of his ordinary work. It is for this reason that he is placed in the safety department, and the inevitable result is that the safety or inspection work is made less effective.

The men generally are better supervised in metal than in coal mines, as a shift-boss in the former rarely has over 50 men under his jurisdiction, and he is in the mine while his shift is at work. The coal mine usually has a fireboss for every 100 to 300 men, and he works chiefly while the men are out of the mine and has comparatively little authority over the men when he is in the mine. When a coal miner is killed underground, work in that mine automatically ceases for the day, and in places the day of burial causes another day's shutdown. On the other hand, the death of a metal miner underground occasions little comment, except among those who aid in removing him from the mine.

The metal mine has no official similar to the fireboss at a coal mine, who examines the working places to see if they are safe before the workers enter them. It would seem advisable, however, to follow coal-mining practice in this regard at metal mines so far at least as to have someone examine workings after shots are fired, in order that incipient fires might be discovered. In case of fire, many metal mines now have an efficient method of warning miners. Stenches are introduced into the compressed-air lines. So far, coal mines have not developed any system of warning as efficient as the stench method.

From the point of view of health, the coal miner has much the better occupation. He works in comparatively good air with comfortable temperatures, and as the air is cool is not bothered by humidity, whereas frequently the metal miner, even when performing actual work only a fourth to a third of the shift, is compelled to wring sweat out of his shirt every few hours.

Though coal dust is explosive, its ordinary physiological effect on the mine worker is held to be negligible —at least until he has worked in it for 30 to 50 years— whereas metal-mine dust, acting through lead poisoning, miners' consumption, etc., sends hundreds of miners to graves before they have worked in it over five years and before they have reached the ordinary prime of life. It is probable that metal-mine dust kills far more men annually in the United States than does coal dust, even including deaths from dust explosions.

Metal mines generally are provided with systematic underground toilet facilities. These are almost wholly lacking in coal mines. Metal mines, too, frequently provide the miners with ice water in barrels set at convenient points underground or pipe city water to central points with available faucets, sanitary fountains, etc., whereas the coal miner generally carries his own drink in his bucket.

Conclusions.—The following conclusions may be drawn from the preceding:

1. Interchange of methods—coal from metal mines. It would appear to the writer that coal-mining operators could with advantage adopt the following methods and practices from metal mines:

(a) Choose young, active, forceful, yet experienced engineers as safety men, paying them enough to attract them to the work.

(b) Provide a more intensive supervision of work (comparable to that of shift-bosses in metal mines) to look after pillar drawing, haulage, timbering, etc.; especially should pillar-bosses be employed more frequently than at present.

(c) Pay more attention to machine drilling. Much of the present-day heavy shooting of coal, giving slack instead of lump, is due to the disinclination of coal miners to drill a sufficient number of holes so that each hole may be loaded lightly.

(d) Provide sanitary toilet facilities underground. This, though now regarded as an absurdity, will undoubtedly be an accomplished fact within ten years.

(e) Learn metal-mine methods of timbering and back-filling and apply them to the support of worked-out coal areas.

(f) Follow the lead of the metal-mine operators in reducing the costs of mineral extraction. If this is not done, coal-mine operators will most certainly alienate the good will of the general public, and some sort of governmental regulation of the industry will possibly result.

2. Interchange of methods—metal from coal mines. Metal-mining operators could with advantage adopt the following coal-mining methods and practices:

(a) Provide more adequate ventilation, thus assuring more healthful and comfortable working places, for this provision will reduce the formation of dust and its dissemination, will lower high air temperatures and humidities and will prevent men from being gassed by

MESABI OPEN PITS LIKE ANTHRACITE STRIPPINGS

In the Mesabi region the cover over the iron ore is taken long distances in large dump cars instead of being cast and dug by the same shovel, as is the method in bituminous strip pits. The locomotives are larger, the shovels are bigger and the cars are of greater capacity in the Mesabi than in the anthracite region. This is a small pit and the shovels are smaller than is the general practice at metallic ore strippings.

the fumes from explosives, etc. In general this can be done only by utilizing mechanical fans with doors, ventilators, tubing, brattices, curtains, etc., all under the constant supervision of a competent ventilating man. In short, metal mines should consider ventilation a vital part of operation instead of a fad or a more or less useless side issue.

(b) After having provided safe and healthful working places, place all work as far as possible, including timbering, drilling, shoveling, blasting, etc., on a contract or bonus basis.

(c) Adopt the haulage methods employed at coal mines, including larger cars, wider gage, the elimination of hand tramming, the introduction of storage-battery locomotives, etc.

(d) Reform the entire method of storing, handling, and using explosives underground. Reduce the consumption of explosives to a reasonable figure by making an intelligent use of stemming.

(e) Compel the workers to buy their own tools, as is done to a great extent in coal mining. If miners and shovelers had to buy their own wrenches, picks, shovels, etc.; and if machine drills and drilling steel were charged against users until returned, the waste piles of our metal mines would not contain the thousands of dollars worth of that material now there. This, of course, is ultimately charged against the cost of production of the metals mined.

(f) Use more systematic methods in handling and distributing timber underground. Thereby much timber could be recovered and re-used in metal mines, and much of it which is now lost without ever having been used could be saved from decay, caves, etc. Remove rails, ties, pipe, etc., immediately from abandoned places and put them in use in active workings, even though it may be necessary in a year or so to replace them in the workings from which they were temporarily withdrawn.

(h) Use electric lamps with the system of rental charge as at coal mines. Thus an ever-present fire menace would be removed.

(i) Use permissible explosives or electric shotfiring in shooting timber. This would tend to make impossible the fires now caused by the use of dynamite and fuse.

(j) Make a more intimate study of the gases which may be met in mines. For instance, it should be learned that it is *not* always safe to go wherever a candle or a carbide lamp will burn, as such an atmosphere may contain carbon monoxide or other dangerous gas. Recently explosions of methane in metal mines have indicated that exploring abandoned places with naked lights is dangerous even in metal mines.

Jig Operating Without Suction Through Coal Bed Serves as Its Own Pump

WHEN the product of a coal mine contains much material in which pure coal is so intimately mixed with refuse that they cannot be broken apart, and when the mixture is of such a specific gravity that it is little different from that of clean coal, jigging is likely to become wasteful or ineffective. Another problem in washing is that of handling the fine coal. The old idea with jigs was to disturb the coal and refuse—and the jig certainly successfully did so—by water under pressure on the upstroke and with a water suction on the downstroke.

The more modern idea is to apply the force in one direction. It makes no difference whether the separation is made by water or air—the lighter material will be driven farther from the side from which the force is applied. If the force comes from opposite sides alternately, the mass will only be mixed and not separated. This is the theory upon which the Montgomery coal washer, built by the Montgomery Coal Washing & Manufacturing Co., Birmingham, Ala., was designed.

The crushed coal or coal to be washed is fed to the jigs either from a storage bin directly above and at the back of the jigs or is elevated from a storage bin built on the ground. In the latter case the feeder gate feeds the coal to the elevator, and the elevator feeds the jigs. If the bin is above the jigs, the gate is arranged as shown at *A* in Fig. 1. In any event the coal falls into feeder box, *B*, and the separation of the coal from its impurities then begins. The refuse that is heavier than the coal, as it falls more rapidly than the purer material through the water in the jig, reaches the stationary screen, *D*. This screen is gently inclined toward the slate gate, *M*.

That gate, which is kept closed until the slate bed rises to the level, *I*, is adjusted by motion of the lever, *R*, which has a latch for engaging in the quadrant, *Q*. This quadrant can be made to oscillate by contact of the roller, *S*, against the weight lever, *P*. Owing to

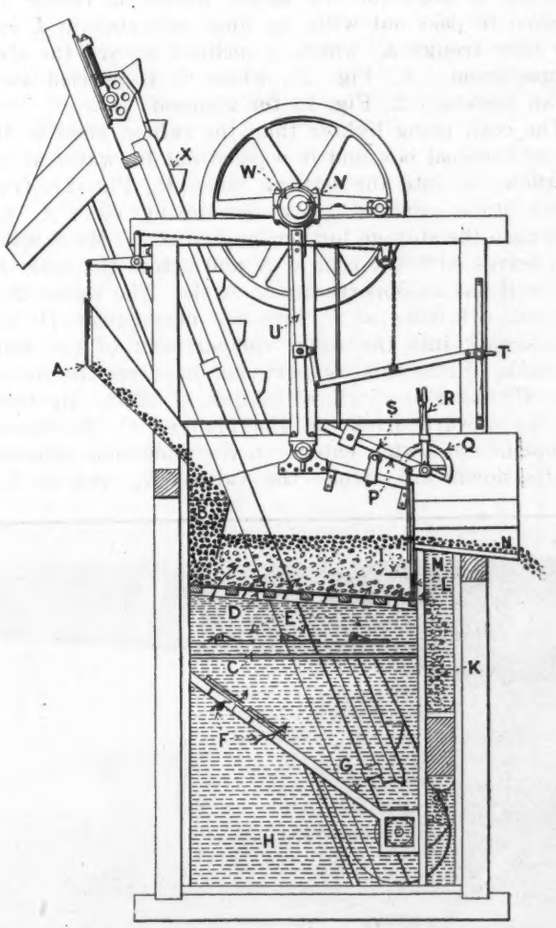


FIG. 1—VERTICAL SECTION OF COAL-WASHING JIG

The plunger of the jig is at *E*, and it has on the upper side valves which open upward and allow water to pass through them when the plunger is lowered and which close when it is raised, enabling the plunger to draw water through the valves *F*. *D* is a screen on which the refuse and coal rest, the former, which is the heavier of the two, being next to the screen. Water passes up through the coal but never goes back through it. It leaves by the coal overflow, *N*, and after settling is introduced below the plunger. Thus the suction of the plunger does not disturb the coal bed on the screen.

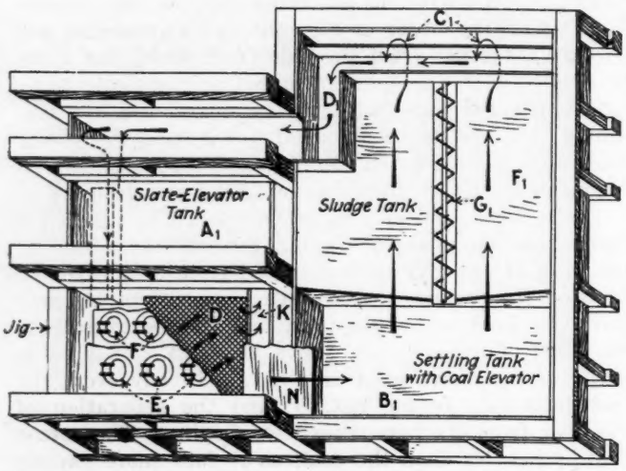


FIG 2—ISOMETRIC VIEW OF JIG AND SETTLING TANK AS SEEN FROM ABOVE

Almost a plan view. The water-bearing coal leaves the jig tank at *N* and falls into a settling tank where a self-draining clean-coal elevator removes the sedimentary material. On account of the size of this tank, the water moves very slowly toward the return trough and the fines settle to the bottom and are caught by a spiral conveyor which carries them back to the clean-coal elevator, where they are mixed with the larger sizes of coal and carried out to washed-coal storage.

this latitude as to movement, material can be handled varying in size, for the larger pieces of refuse are allowed to pass out with the finer materials at *L* into the slate trough *K*, which is inclined toward the slate compartment (A_1, Fig. 2), where it is carried away by an elevator (*X*, Fig. 1) for disposal.

The coal, being lighter than the refuse, rises to the top of the coal box and is washed out by water at the overflow, *N*, into the settling tank (B_1, Fig. 2), from which it is removed by a dewatering elevator, not shown, to the storage bin for washed coal. Much water also leaves with the coal at *N* and enters the tank, B_1, where it has an opportunity to settle. The water, thus cleaned, overflows at C_1 into the passageway D_1 and passes back into the water compartment of the main jig tank. From this compartment it enters the waterway, *H*, under the inclined bottom, *G*, of the jig tank. On the upward stroke of the plunger, *C*, the valves, *F*, open, and water enters on its underside, whereas on its downward stroke the valves, *E*, open in the bottom of the plunger, *C*, admitting water on top of the plunger between it and the screen frame, *D*.

On the upward stroke of the plunger the water is forced through the screen, *D*, and through the bed of coal and refuse. It then passes out through the overflow, *N*, to the point of beginning. Thus the jig acts as its own pump, and centrifugal pumps or tanks set on high towers are not required, as the water returns by gravity from the settling tank to the jig tank, and the jig does all the pumping that is necessary. In this way less machinery is required, all of which reduces maintenance and running expense and the frequency of breakdowns. Not infrequently a division in function at a washer between two or more machines, like a division of labor between two or more men, doubles or otherwise increases the possibility of trouble. The only fresh water needed is that which is necessary to replace the water carried away with the wash coal and refuse, which is about 50 gallons per ton of coal washed.

A few words should be added relative to the driving mechanism. The plunger, *C*, is driven from the main drive shaft, *V*, through an adjustable eccentric, *W*, and the connecting rod, *U*. The feeder gate, *A*, is operated by the floating lever, *T*, which is attached to the connecting rod, *U*, and the quantity of coal entering the jig is regulated by raising or lowering the lever, *T*.

The adjustability of the eccentric is an item of much importance, for jigs that will wash one class of coal will not give satisfactory results with another. An adjustable jig, therefore, is necessary, for it can be regulated to suit the class of coal that at any time may have to be washed.

Some further information should be given regarding the settling tank. These tanks are built with ample width and very long in order to give the coal time to settle before water is returned to the jigs. An elevator boot is provided somewhat deeper than the remainder of tank B_1. The settling part of the tank F_1 is built in variable lengths, depending on the class of coal and the number of jigs. It is V-shaped and in this V runs a screw conveyor, G_1, that returns all settlings to B_1, where they are picked up by the dewatering elevator, not shown.

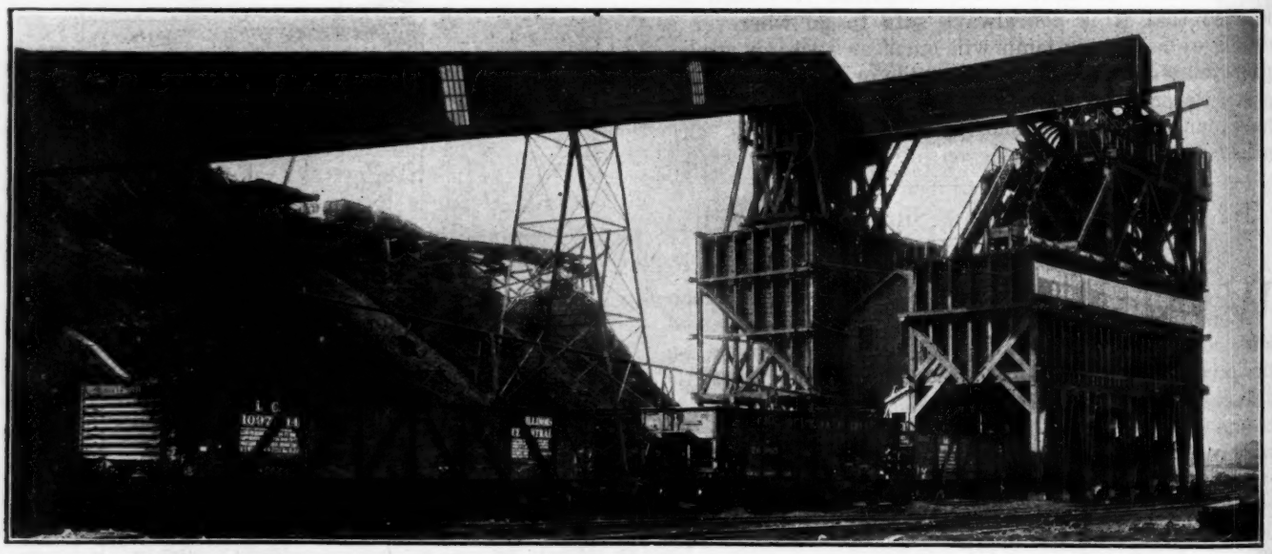


FIG. 3—MONRO-WARRIOR COAL & COKE CO., WASHERY AT NO. 1 MINE, NORTON COAL MINING CO.

This plant at Nortonville, Ky., has a capacity of 1,600 tons per day. It was completed in the early part of this year. The Norton Coal Mining Co. is a subsidiary of the company that owns and operates the washer.

How to Repair and Balance a Broken Belt Pulley

Broken Pulleys May Be Put Back in Service by Repairs Made at the Mine — Method of Balancing a Pulley — Preventing the Belt from Slipping—Covering a Pulley for Greater Adhesion

By Gustav H. Radebaugh
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A FEW of the common kinds of material from which pulleys are made are wood, pressed steel, paper-pulp composition and cast iron. The two most common types of pulleys are split and solid. The split pulley is used exclusively in transmitting power from line shafting. In using this style of pulley it is never necessary to take down the shaft to remove the pulley, this being an advantage over the solid pulley for this kind of transmission work. The drive pulley on an engine, or main machinery shaft generally is a solid pulley. These pulleys give much better service on this type of drive than can be obtained by the split pulley.

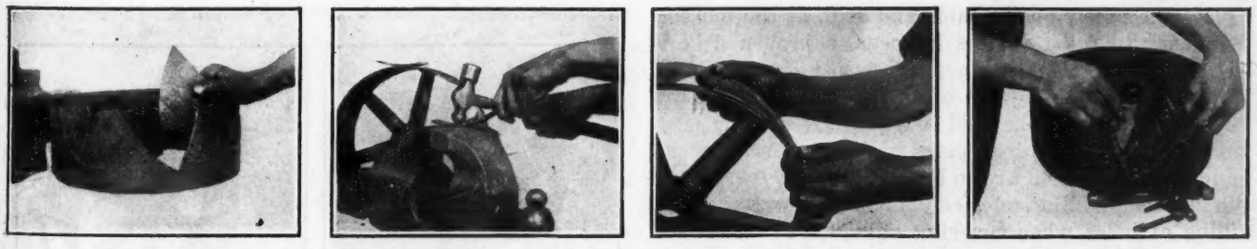
A pulley delivering considerable horsepower that is keyed on the shaft and is expected to render long and continuous service must never have an opportunity to loosen up on the shaft fit. This, of course, is impossible with split pulleys. The clamp bolts become loosened, causing the pulley to spring apart. On ordinary small drivers the split wooden pulley is used to good advantage, it being unnecessary to cut keyways and fit keys. The pulley is held on the line shaft by friction. The center bushing which fits on the shaft is fitted in the pulley in such a manner that tightening the bolts clamps the bushing securely to the shafting. Pulleys of the same design can be used as drivers and as loose pulleys. If used for a loose pulley, a brass bushing and grease cups must be provided. The pulley, which is used as a driver, must be arranged with setscrews or keys, or both.

Pulleys on mine power-driven machines quite frequently are broken or damaged to such an extent that it is impossible to repair them. Many pulleys, however, are discarded that could be placed back in service by a little planning and a few minutes work in the mine shop. There are two common ways of patching broken cast-iron pulleys: by oxy-acetylene welding and by patching with rivets. If the spokes are broken, about the only practical method is the welding process. This necessitates taking the job to a commercial shop for the repair if the mine repair shop is not equipped with a welding outfit. If the flange or face of the pulley is broken, the repair can be made in the mine shop, which is advantageous in conserving time and cost. If the machine is in use and the broken pulley throws it out of service, every minute that can be saved means a great deal as several trucks, teams and men may be held up on the job until the pulley is repaired.

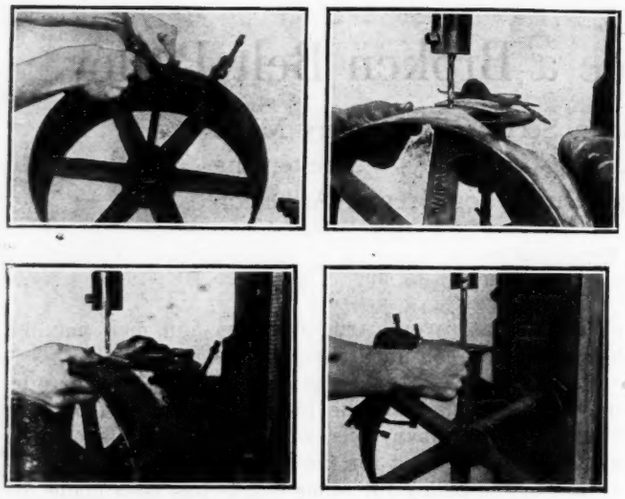
When a pulley is broken as shown in Fig. 1 it may be impossible to find all the pieces that came from the fracture, but as many pieces as can be found should be gathered up and kept for the repair. After close examination of the pulley for other cracks has been made the method of mending the break should be decided upon. In this job the pulley is cracked across its entire face. This necessitates placing steel straps on each side of the spokes. To proceed with the repair procure a piece of soft steel scrap about $\frac{5}{16}$ in. or $\frac{1}{4}$ in. thick to 1 in. to $1\frac{1}{4}$ in. wide and cut to a length that will permit 3 or 4 in. to extend on each side of the patch or crack. The stock is then bent to the proper radius to fit the inside of the pulley. The bending operation is shown in Fig 2. Notice how simple it is to bend the piece when it is held in the vise as shown. The vise jaws are opened and with the ball peen of the hammer the stock is bent to the desired shape.

A good job of bending is important, as the strap will fit the job much closer if the bend is an even one and the pieces that were broken from the pulley can be held in more accurate position. In bending steel stock of this size a much better job can be done with the stock cold. It is common among some mechanics to heat a job such as this for bending. It will be found, however, that the cold bend is much easier and is just as good. During the bending operation constantly check the shape of the bend with the pulley. After you are satisfied that the strap has been fitted as closely as possible it is then ready to be located as in Fig. 3 and clamped in position. If it is at all possible, the strap should be located about $\frac{3}{4}$ in. from the edge of the pulley. This, however, is entirely influenced by the shape and number of the pieces broken from the fracture.

A glance at this view will show the large piece that was being held by the operator in operation 1 is fitted in place, showing that another small piece is needed to finish out the patch. This piece was either lost or was in several small pieces. This makes it necessary to cut and shape a piece to fit, as shown in Fig. 4. This was made from aluminum taken from the lower portion of an old discarded crankcase. A template was made



FIGS. 1, 2, 3 AND 4—FITTING THE BROKEN PIECES INTO THE PULLEY AND FORMING THE BRACE
All pieces of the broken section are gathered and matched in place. Any pieces too small to be fastened to the brace are discarded. The bracing piece is then formed as accurately as possible and the face of the pulley filled in with the large broken pieces and a filling piece which takes the place of lost parts or small parts



FIGS. 5, 6, 7 AND 8—CLAMPING AND DRILLING PREPARATORY TO RIVETING

After all parts are assembled an extension is placed on the plate of the drill press. This plate prevents the pulley from rolling and permits the proper drilling of the holes for attaching the broken pieces to the brace and the brace to the pulley.

of the exact shape of the required piece; the aluminum was then marked off, sawed, and filed to shape. It was then fitted into position.

Fig. 5 shows clearly the location of the patching strip. The operator is making close inspection of the patch to be sure that all pieces fit properly. In clamping a job such as shown here the parallel machinist clamp will be found best adapted to the job. Clamps taken from old clothes wringers also can be used. This job could be done without the use of clamps, but it is not recommended, as it makes the job much more difficult. When clamps are not available the approximate location of the holes can be made in the rim and a hole drilled. The strap is then marked off and the hole drilled. It is then riveted in position. The next hole is located and drilled and the rivet placed. This is continued until the job is finished. You will be very fortunate if a good smooth job is obtained. It is obvious that it would be difficult to hold the pieces in place while drilling.

The clamps hold the pieces securely in the proper position, which insures a good, even job. Every mine shop should be equipped with a couple of pairs of good dropped forged clamps. They will pay for themselves in a short time. After the pieces are clamped in position on the patching strip, the job is now ready to be laid out for drilling. Some discretion must be used in locating the holes. They should be placed to insure proper holding of the patch with the rivets.

To make the job of drilling an easy one, an old shop practice, as shown in Fig. 6, can be employed. In drilling holes on a job of this kind it is nearly impossible to place the pulley on the table and drill, as the tool has a tendency to roll. If this happens, a broken drill is the result. By clamping a small board on a strip of steel on the platen or table of the drill press as shown, the pulley easily can be held in a positive drilling position. This type of drill press set-up is used for all cylindrical jobs which are to be drilled on the periphery, such as the drilling of steel bands for water tanks, drilling of holes when covering pulleys, etc.

The size rivet that is to be used is decided upon and the proper drill for the rivet is selected. For a job as shown here a ¼-in. rivet round head is satisfactory. If rivets cannot be found in the shop supply, it is an easy matter to make up enough for the job from ¼-in. round stock.

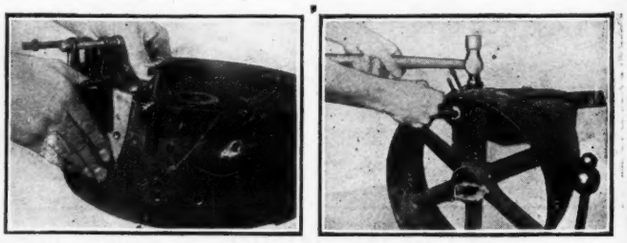
The job is then placed on the strip clamped to the table of the drill press and all the holes are drilled as indicated in Fig. 7. The surface of the pulley must be left smooth. This necessitates the countersinking of the holes, which permits the rivets to be driven down flush. This can be done with a countersinking tool or with a drill that is twice the diameter of the rivet. In Fig. 8 is shown a ½-in. drill countersinking the holes preparatory to riveting. A rivet is placed in a hole and gaged for proper length, as shown in Fig. 9. It should protrude from the face of the job three-quarters of its diameter for a countersunk head. This, of course, is regulated to a certain extent by the depth of the countersink. Judgment must be used, as it may be best to cut one rivet to estimated length and rivet it down. This will assist in gaging the length of the other rivets. It always is best to have the head fill the countersink completely.

The most convenient way to hold this job for riveting is by placing a heavy bar of iron in the vise and clamping it securely. Hold the pulley for riveting as shown in Fig. 10. By backing up the rivet in this manner and delivering light, firm blows with the ball peen of the hammer a good tight job should be the result. The loose pieces which were fitted closely in position and held securely with the clamps driving the drilling and riveting operation are now held securely in place with the rivets. The clamps can now be removed. The newly formed heads of the rivets oftentimes are not riveted down flush and it becomes necessary to file them flush with the pulley face, as shown in Fig. 11.

The view in Fig. 11 gives a good idea of the correct way to hold a file. Notice how the operator's right hand grasps the file handle. His forward stroke is the cut stroke, and by grasping the file firmly and applying a little pressure the file cuts as it is designed to do, removing the extra head of the rivets with a few strokes of the file. Too often the file is held in one hand and rubbed over the job and expected to cut. This is hard on the file and is improper practice. The file pressure always should be released on the return stroke.

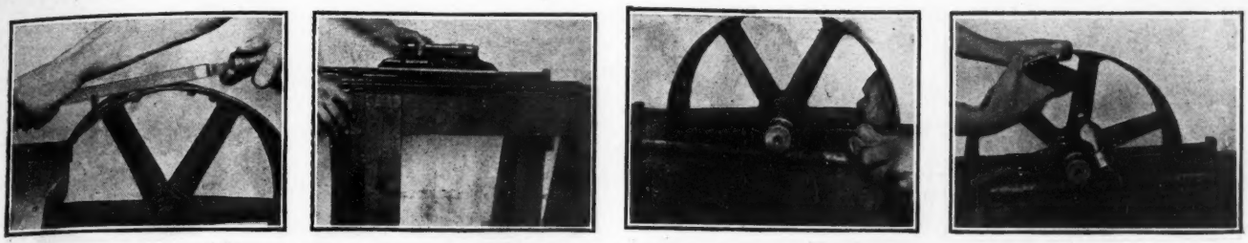
A file never should be used without a handle—it is too dangerous a practice for the shopman as he has seen the many accidents caused by handleless files. Therefore, the mine-shop foreman should take advantage of the well-established practice and supply files with good, substantial handles of proper shape, so that better jobs of filing can be done that will protect against accidents. This operation completes the patching of a pulley.

If the pulley just repaired is used on high-speed power transmission it may be necessary as well as advisable to balance the pulley. The strips and rivets used in repairing make the pulley heavier on one side than the other, which throws it out of balance. If the pulley



FIGS. 9 AND 10—ALL PARTS CLAMPED AND RIVETED

With the parts mounted the holes are lined up and rivets inserted and peened over, thus fastening all parts rigidly.



FIGS. 11, 12, 13 AND 14—DRESSING UP SURFACE AND BALANCING THE PULLEY
Filing the surface is important so that the belt will run true. Balancing the pulley is the next step. This is done by placing a temporary weight on the pulley to locate where weight must be added to create balance

is used on high-speed work, this may be the reason for vibration and jerking of the machine.

A pulley is said to be in standing or static balance when its center of gravity coincides with the axis upon which is revolves. A pulley may be in standing balance and not in balanced state when running at high speed. This is known as running balance. The exact position of the heavy section should be located and the balancing effected either by reducing the weight of the wheel or by adding counterweight opposite each section and in the same plane at the proper radius; but if the rotating part is rigidly mounted on a stiff shaft, a running balance that is sufficiently accurate for practical purposes can be obtained by means of comparatively few counterweights located with reference to the unbalanced parts.

To do this the most simple method that has been developed in the commercial shop is to level carefully with a parallel bar, as shown in Fig. 12. In this job long bolts of $\frac{5}{8}$-in. diameter have been substituted for the commercial parallel. They can be used with about the same guarantee of accuracy as is expected from the parallel bar, and, of course, will eliminate the necessity of borrowing or buying the standard parallel bar. In leveling up a job as shown here be sure that the rods are on the same plane. This can be determined by placing a straight edge across the two bolts and adjusting to a level. Washers, paper, tin, shangles, etc., are a few objects for blocking up material. They may be used when bringing the rods to an accurate horizontal plane surface.

After the parallel ways have been provided and leveled, an accurate shaft or mandrel is inserted through the bore of the pulley. It should be understood that this must fit snugly. The job is then placed on the bolts as shown in Fig. 13. If the pulley is in an unbalanced state it will turn until the heavy side is downward. If the center of gravity of the pulley coincides with the center of the shaft there will be no movement, but if the center of gravity does not coincide with the center of the shaft the shaft will roll until the center of gravity of the wheel comes directly under the center of the shaft or until the heavy side of the pulley is downward. The center of gravity may be brought to the center of the shaft by adding or taking away weight at proper points on the pulley. The simplest way to do this is to make up a plastic mass of clay or mud and apply this to the light side of the pulley, as shown. This acts as a counterweight, and when the proper amount has been placed it should be possible to revolve the pulley in either direction or in any position, and the shaft and pulley should remain stationary when the hand is removed.

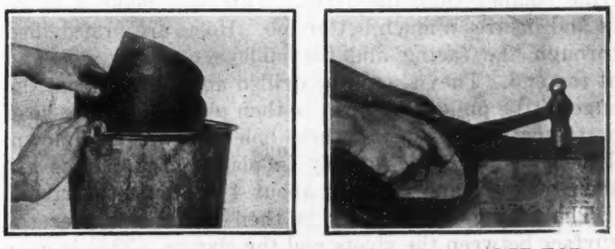
A chalk line is made to indicate the center of the clay counterweight. The mud or clay can now be removed from the pulley and weighed. A counterweight of equal weight made from steel can be secured and riveted in place, as shown in Fig. 14. It is best after the new counterweight has been placed to try out the job for balance before riveting in place.

Many belt drives on mine machines give considerable trouble in keeping them on the pulleys. In a heavy pull the belt often leaves the pulley. This may be caused by not having the shafts parallel. The belt will always run toward the "low side" of the pulley—on the side where the centers of the shaft are closest. It is obvious that the friction of leather on leather is much greater than of leather on iron or steel. Leather-covered pulleys will transmit considerable more power than plain, uncovered pulleys for the same belt tension. The slippage can be considerably eliminated. In covering a pulley with leather the grain side of the leather should be on the outside.

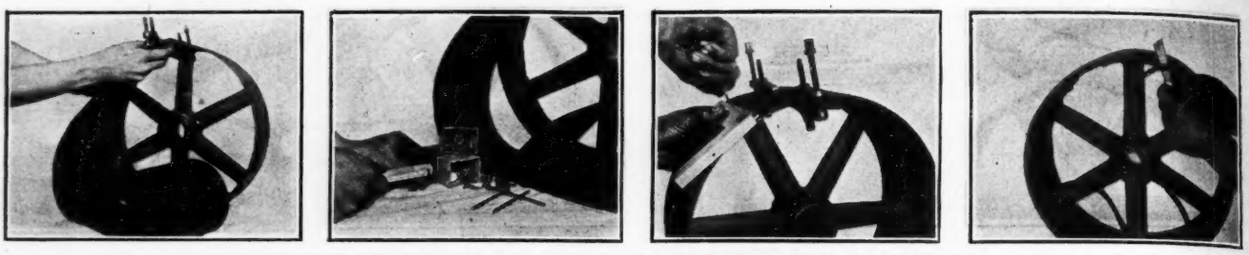
If the shafts are checked and found parallel and the belt continues to leave the pulley the trouble may be remedied by crowning the pulley. The crowning of a pulley tends to keep the belt on only when the belt as a whole does not slip. A slipping belt will run off a crowned-faced pulley quicker than from a straight-faced pulley. If this fails to accomplish the desired results the pulley face should be covered with leather to eliminate the slippage which causes the difficulty since all the other schemes failed.

It should be understood that creeping is due to the tension element and must not be confused with the slip due to insufficient frictional grip on the pulley. To increase the frictional grip of a belt the belt manufacturers instruct all users of leather belts to run the grain side to the pulley. It is claimed that 33 per cent more power can then be transmitted than with the flesh side to the pulley. The grain of the leather has a velvety surface which enables it to hug the pulley closer than the hard-flesh side.

In covering a pulley two common methods are employed: the glued endless cover and the riveted cover. To put on a glued endless cover select the leather which is to be used on the job, make the cover endless and about $\frac{1}{8}$ in. to the foot shorter than the circumference of the pulley. This is done in the same manner as you



FIGS. 15 AND 16—MAKING THE LEATHER SOFT FOR MOUNTING ON THE PULLEY RIM
Softening the leather generally will aid in fitting it to the pulley. Light hammering also will make the leather more pliable.



FIGS. 17, 18, 19 AND 20—SURFACING THE PULLEY WITH LEATHER
The leather covering is next applied to the pulley by rivets. The heads of the rivets should be on the outside. The ends of the leather facing should be made to meet so as to form a smooth joint.

would glue a belt. The face of the pulley should next be thoroughly cleaned with gasoline. The endless cover is then slipped or driven onto the pulley about an inch. An application of cement is then applied. After applying the glue the cover is driven in place by lifting the pulley and striking the cover edge on the bench or floor. This should be done as quickly as possible, as the cement has a tendency to set.

A good formula for a cement to fasten leather to iron is as follows: Paint the iron with some kind of lead color; say, white lead and lampblack. When dry, cover the cement as follows: Take 1 oz. of the best glue, soak it in cold water till soft, then dissolve it in 1½ fl.oz. vinegar with a moderate heat, then add one-third of the bulk of white pine turpentine, thoroughly mix and by means of the vinegar make it of the proper consistency to be spread with a brush. Apply it while hot. After the cover is driven in place a hammer handle should be used to rub out all the air pockets between the leather and the rim of the pulley. To do this job this way requires considerable time and practice. It is not recommended for the mine shop, but may come in handy some time. This principle can, of course, be applied to several other types of repair jobs.

The easier way to cover a pulley is to rivet on the covers. This is done by first cutting the leather facing to 1 or 2 in. longer than required, and it does not complicate the job if it is a little wider. This leather facing can be made from old leather belts, in fact any leather stock that has the necessary size to cover the pulley. To soften up the leather and make it pliable so that it will fit snugly on the pulley it is advisable to soak it in water, as illustrated in Fig. 15, for an hour or more. It is then removed and hammered out, as in Fig. 16. This operation is not absolutely necessary, but if the belt is stiff and dry before it was placed in the water bath the hammering has a tendency to make the leather more flexible and pliable. The leather facing is next clamped to the pulley as shown in Fig. 17.

The job is now ready to be drilled to receive the copper rivets. The rivet is measured and the proper drill selected (Fig. 18). The drill should be just a trifle smaller than the rivet. This will make a drive fit and insures a much better job. Holes are first drilled through the facing and the pulleys on each side and at the end. They should be drilled about ¾ in. from the edge of the pulley. A rivet is then placed with the head on the outside in each of these holes and fastened down. This holds the end securely in place. The clamps are then removed and clamped about 4 in. from the rivets.

The facing or covering is then hammered over the surface between the rivets and the clamps. This is done to stretch it evenly over the surface of the pulley. The drilling and placing of rivet is repeated, and the clamps are again changed. This procedure is followed until rivets have been placed entirely around the pulley. The number of rivets required must be decided upon by the repairman. It is not necessary to have them any closer than necessary to prevent buckling of the cover.

To make the ends meet closely before the last two rivets are placed, the cover is cut in length as shown in Fig. 19. After this is done the last two rivets are placed. The edge is now trimmed as in Fig. 20, which completes the work.

Reviews Work of N. J. Fuel Commission

In a report to Governor Silzer of New Jersey, Wm. T. Grier, chairman of the New Jersey Fuel Commission, on May 24 reviewed the work of the commission during the eight months ended April 1. He pointed out in particular that despite the shortage of domestic sizes of anthracite last winter the State of New Jersey received 25 per cent more than its original share, which was 60 per cent of the total received the previous year. It was pointed out that there was no shortage of bituminous coal in the state and that the total cost of the New Jersey commission's work was $4,000. In conclusion, the report states:

"Congress adjourned without doing anything to avert a similar shortage in the future, except by providing for the appointment of another Fact-finding Commission that will probably report to the next session of Congress.

"Our own Legislature adjourned in like manner without doing anything.

"The State of Pennsylvania, which absolutely controls the anthracite situation, has up to date done nothing to avert a repetition of the conditions of last year, and its Legislature, which meets biennially, will adjourn at an early date.

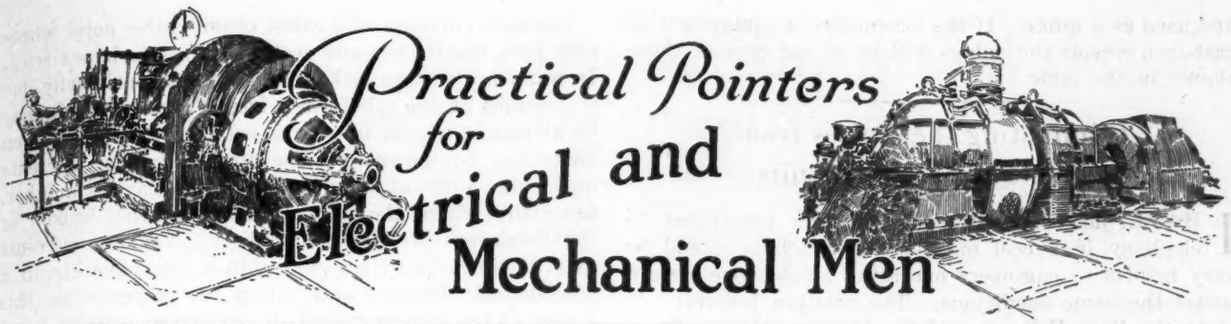
"The Interstate Commerce Commission has done nothing toward an adjustment of coal-carrying rates, which our experience indicates are grossly excessive in our state; nor has it attempted to penalize coal-carrying roads, which in some instances ignored the commission's orders during the shortage period.

"The agreement between miners and operators, under which mining was resumed on Sept. 15, 1922, will expire Aug. 31, 1923, and up to date no effort appears to have been made to secure a renewal.

"Several railroads are storing vast quantities of coal for their own use. Whether or not they have inside information as to the probability of another shortage resulting from a strike, is not disclosed."

DR. RICHARD B. MOORE, chief chemist of the U. S. Bureau of Mines, has resigned, to take effect June 1. He will be succeeded by Dr. Samuel C. Lind, who has for some years acted as a superintendent of the Rare and Precious Metals Experiment Station of the bureau at Reno, Nev. Dr. Moore will enter the commercial field with a well-known firm of consulting chemists and metallurgists in New York City.

R. H. GROSS, OF BOSTON, has been made a member of the Bituminous Operators' Special Committee to serve during the absence of J. G. Bradley. Mr. Bradley expects to make an extended European trip.



What Determines the Speed of An Induction Motor?

I HAVE been greatly interested in your pages under the heading "Practical Pointers for Electrical and Mechanical Men," and have found a great deal of information in them. I am glad to see the explanations you have been publishing of fundamental and more advanced application of electricity as used in coal mining.

Will you kindly give an explanation in your columns of what determines the speed of an induction motor at no-load. Confusion frequently arises in my mind when speaking about the speed of an induction motor. For instance, I sometimes hear of an induction motor of 690 r.p.m. and then again the same motor is sometimes called a 695-r.p.m. motor, while sometimes it is even called at 720-r.p.m. motor.

The no-load speed of an induction motor is determined by the frequency of the supply circuit and the number of poles in the motor. This represents the normal no-load speed of the motor when across the line and all speed control equipment has been cut out. The full-load speed will be from 4 per cent to 8 per cent slower, depending upon the design of the motor.

Knowing the frequency of the circuit and the number of poles into which the winding has been arranged the speed may be calculated from the following formula:

$$R.P.M. = \frac{120 \times frequency}{no.\ poles}$$

This gives the no-load or synchronous speed, which always is slightly higher than the actual no-load speed. This slight difference is due to the principle of the motor; a small difference between the synchronous speed and actual no-load speed is necessary for the motor to operate.

Induction motors frequently are designated by the number of poles in the winding and the frequency of the circuit rather than by a particular no-load speed, which is a slightly variable quantity in all motors.

The following table derived by use of the above formula will assist in pointing out the relation between frequency, poles and speed:

SYNCHRONOUS SPEED

Poles	60 Cycles	40 Cycles	25 Cycles
2	3,600	2,400	1,500
4	1,800	1,200	750
6	1,200	800	500
8	900	600	375
10	720	480	300
12	600	400	250

How Big a Load Can a Locomotive Haul?

WHAT is the method of calculating the haulage capacity of electric locomotives? Is there any simple table which would show the haulage capacity on various loads? I am merely interested in knowing how many cars or, in other words, what trailing load may be attached to a locomotive and hauled efficiently.

W. VIRGINIA.

The haulage capacity of a locomotive depends upon many important factors, principally among which is the condition of the equipment—in particular, the locomotive, the cars and the track. Friction of the bearings, track friction, curves, grades, gear ratio and air resistance also are important factors, and without any definite knowledge of these quantities only an estimate can be made. For the average condition the following assumptions can be made and the table appended probably will give a fair idea of the haulage capacities of various sizes of locomotives.

The rated drawbar pull of a locomotive equipped with cast-iron wheels is 20 per cent of its weight; when equipped with steel wheels it is 25 per cent of its weight.

Assuming the locomotive to be equipped with steel wheels and the coefficient of friction to be 30 lb. per ton on a level track and 20 lb. per ton for each per cent of grade, the following table may be constructed

TABLE GIVING LOCOMOTIVE DRAWBAR PULL AND HAULAGE CAPACITIES

Locomotive Weight, Tons,	Level Track		1 Per Cent Grade		2 Per Cent Grade		3 Per Cent Grade		4 Per Cent Grade		5 Per Cent Grade		6 Per Cent Grade	
	Drawbar Pull, Pounds	Haulage Capacity, Tons	Drawbar Pull, Pounds	Haulage Capacity, Tons	Drawbar Pull, Pounds	Haulage Capacity, Tons	Drawbar Pull, Pounds	Haulage Capacity, Tons	Drawbar Pull, Pounds	Haulage Capacity, Tons	Drawbar Pull, Pounds	Haulage Capacity, Tons	Drawbar Pull, Pounds	Haulage Capacity, Tons
3	1,500	50	1,440	29	1,380	20	1,320	15	1,260	12	1,200	9	1,140	8
4	2,000	70	1,920	39	1,840	26	1,760	20	1,680	15	1,600	12	1,520	10
5	2,500	84	2,400	48	2,300	33	2,200	24	2,100	19	2,000	15	1,900	13
6	3,000	100	2,880	58	2,760	39	2,640	29	2,520	23	2,400	18	2,280	15
7	3,500	117	3,360	67	3,220	46	3,080	34	2,940	27	2,800	22	2,660	18
8	4,000	133	3,840	77	3,680	53	3,520	39	3,360	30	3,200	25	3,040	20
10	5,000	167	4,800	96	4,600	66	4,400	49	4,200	38	4,000	31	38,00	26
13	6,500	216	6,240	126	5,980	85	5,720	63	5,460	50	5,200	40	4,940	33
15	7,500	250	7,200	144	6,900	99	6,600	73	6,300	57	6,000	46	5,700	38
17	8,500	283	8,160	163	7,820	112	7,480	83	7,140	65	6,800	52	6,460	43
20	10,000	333	9,600	192	9,200	132	8,800	98	8,400	76	8,000	62	7,600	51
25	12,500	416	12,000	240	11,500	164	11,000	122	10,500	96	10,000	77	9,500	64

and used as a guide. If the locomotive is equipped with cast-iron wheels the values will be 80 per cent of those shown in the table.

Eliminating the Noises from Mine-Telephone Circuits

I HAVE just encountered a problem pertaining to telephony in a coal mine which I believe would be very helpful to engineers operating a telephone system under the same conditions. The problem follows:

At the Rich Hill mine of the McClane Mining Co. a telephone circuit is run through the length of the mine—3 miles—in parallel with a 250-volt traction circuit. The average distance between the two circuits is 10 ft. Lately the telephone circuit has been giving very inefficient service, due to excessive receiver noises in all phones in the mine.

At first I followed the circuit, thinking that the telephone wires might be lying on the trolley circuit at some crossover or that the wires might be too close to the trolley circuit. But a thorough inspection failed to place the cause of the trouble as such.

The only possible cause left then was in the insulators. It was concluded that a leakage current—present in most all damp coal mines—found a path through a broken-down telephone insulator, followed the telephone circuit and caused the receiver noises. However, as the spacing was considerable, this did not seem to be the cause.

As we have no insulation resistance measuring instruments or devices, no definite insulator could be tested and found to be broken down. The only method of eliminating bad insulators was by observation. When a cracked insulator was found it was replaced. Or when a wire was almost eaten through—probably caused by the leakage current flow through that insulator—the insulator was discarded. After a number of insulators were replaced, the system was greatly improved, the noises being much reduced.

As this trouble that I experienced is unusual, I hope it will be of interest to engineers operating telephone circuits in a mine where the circuit is in parallel with a traction circuit, especially in damp mines where high leakage currents are present. W. G. HAGESTEN.

Meadowlands, Pa.

Noises in mine-telephone systems may be broadly classified into three main groups—namely, faults in the equipment, induced currents and leakage currents.

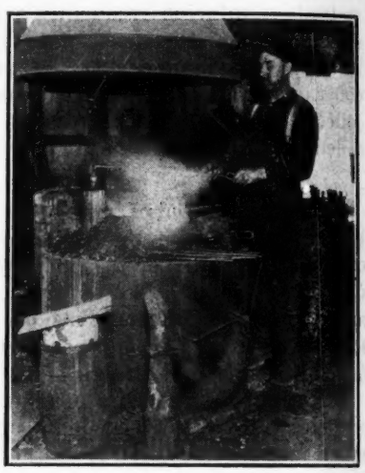
Defects in equipment may be due to many causes, such as moisture, incorrect assembly, grounds, short-circuits, etc., in the telephone. These difficulties may easily be eliminated by carrying on hand a spare telephone, which may be installed and the defective one repaired. By such a plan the telephones may be kept in good operating condition at all times, the spare telephone always being the last one returned for repairs.

Induced currents may be present due to the telephone circuit paralleling an alternating-current or direct-current circuit; a fluctuating load on a direct-current system will at times cause considerable noise. The closer the telephone circuit is to any other line the greater will be the induction. The most common practice used to prevent induction is the transposition of the telephone line wires. This is an interchange of position of the telephone line wires every 20 to 50 ft. Another method is the use of a twisted pair of wires for the telephone circuit.

Leakage currents will cause considerable noise whenever they travel over any section of the telephone circuit. In mine work these leakage currents are primarily due to grounds on the telephone wires. These grounds may be at insulators, on the wires between insulators or on switching equipment on the line. Leakage currents may enter a line at one point and later leave at another, especially where the insulation has become broken or the insulators are damp and dirty. Leakage currents may at times find their way into a telephone circuit a considerable distance away from the trolley wire; this is due to the return circuit of the trolley system being grounded and the return current selecting any path which presents a low resistance.

An Easy Way to Wet Down a Forge Fire

AN OLD saying goes, "Habit makes cowards of us all," and there is much truth in these few words. Because of habit one frequently does routine work mechanically, with little mental exertion to suggest how it might be more efficiently accomplished. Thus, many of the methods of the blacksmith about the mines have been handed down through several generations without modification. Consequently it is not surprising to observe that most blacksmiths still adhere to the old method of wetting down the outer region of the fire on the forge by dipping water by means of a tin can from the tempering barrel and pouring it around the fire in an irregular stream



WETTING THE FIRE MADE EASY AND SAFE

This simple and efficient method gives an even distribution of the water and permits the control of wetting without the steaming and burning that frequently occurs when the old method is employed.

How much better is the method pictured in the accompanying illustration! It is the one employed by a blacksmith in the shop of the New Field By-Products Coal Co., at North Bessemer, Pa. The bottom of a heavy tin can is punctured with holes so as to form a sieve, and is suspended in a trunnion handle. When not in use the can rests on the bottom of the tempering barrel with the grip projecting above the surface of the water. The fire is wetted down evenly, giving a more uniform heat, and the operation is accomplished by the blacksmith standing erect and away from the fire.

COAL PRODUCED DURING 1922 IN QUEENSLAND, Australia, totaled 958,519 tons as compared with 954,763 tons in the previous year, according to the report of Henry Marshall, Under Secretary for Mines. The output of coke in the Ipswich district was 5,265 tons as compared with 7,557 tons in 1921. Mr. Marshall says that depression in the coal trade necessitated closing down several of the mines in the Ipswich district, which affected the output of coke materially. In this district during the year two coal-washing and cleaning plants were in operation and another started operations early this year. One of these plants has a laboratory for testing the quality of the products of the washer.

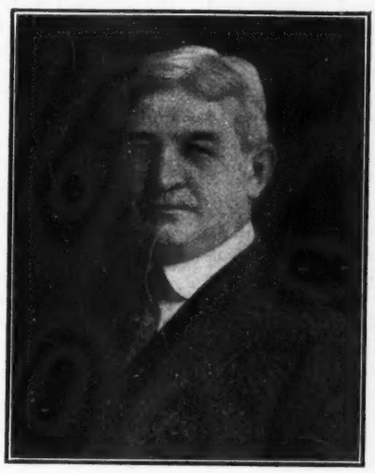
H. M. Griggs Explains How the Ore & Coal Exchange Handles Lake Coal Traffic

In an address on "The Transportation of Lake Coal," before the convention of the International Railway Fuel Association, May 22, at Cleveland, H. M. Griggs, manager of the Ore & Coal Exchange, Cleveland, prefaced his remarks with the statement that the subject was of such magnitude and interest that in a single paper one could hope to deal with it in only a brief and general way.

"Bituminous coal," said Mr. Griggs, "has been shipped from ports on Lake Erie by vessels to destinations on the Great Lakes for considerably more than half a century. For a number of years the tonnage was quite small, gradually increasing until in 1896 the total was 4,000,000 tons. By 1905 it had grown to 10,000,000 tons and in 1910 to 20,000,000 tons. In 1913 the tonnage reached 26,800,000, and the same amount was moved in 1917. The maximum was reached in 1918, the war year, when 28,153,000 tons of bituminous coal were transshipped by vessels from Lake Erie ports.

"The first general pooling of Lake coal was in June, 1917, the pool being operated during the season of 1917 as the Lake Erie Bituminous Coal Exchange. Before the opening of navigation in 1918 the pool was reorganized and operated by the railroads, Lake coal shippers, vessel people and ore shippers jointly under the title of Ore & Coal Exchange.

"After the close of the 1918 season the pooling of Lake coal was discontinued. The Ore & Coal Exchange was continued by the U. S. Railroad Administration, then operating the railroads, for the season of 1919. When the carriers were turned back to private ownership in March, 1920, all of the railroads interested in the coal and ore traffic to and from Lake Erie ports continued the organization and have since operated it at their expense.



H. M. GRIGGS
Manager Ore & Coal Exchange, Cleveland

"The purpose of the Ore & Coal Exchange is to facilitate the handling of the Lake coal and ore traffic; to expedite the release of cars loaded with Lake coal and to provide a sufficient supply of cars for ore loading as vessels arrive at Lake Erie ports. If the ore and grain cargoes were unloaded promptly and regularly there would be no supply of boats for the upbound coal loading, so the handling of the ore cargoes is an intimate part in providing vessels for and in the movement of Lake coal.

"Cleveland is the headquarters of practically all of the Lake coal transshippers, the vessel fleets and the ore shippers, the few not located there having branch offices to look after the Lake traffic. The Ore & Coal Exchange assembles reports each morning from all of the coal docks and ore docks, giving full information to Lake coal shippers and vessels as to the coal at port and due within the following four 12-hour periods, and shows the boats unloaded during the previous 24 hours, at the ore docks at 7 o'clock each morning and due during the next three 24-hour periods. In short, the reports from the docks and from the superintendents' offices of the railroads of the coal in transit are centered in the Exchange, as well as similar reports covering the ore movement, so that, with a complete picture of the Lake situation before the Exchange, the Lake coal shippers and the vessel people, boats will be provided at the time sufficient coal reaches port to complete the cargo.

"This centralization and co-operation of the coal shippers and railroads and vessel interests has greatly reduced the time it has taken to release and unload the coal cars at Lake ports and return them to the mines for loading, as well as to give better dispatch to vessels in loading coal and unloading ore.

"The transportation of Lake coal may be separated into two parts: First, the rail transportation to Lake ports and the dumping into vessels; second, the transportation by vessels from Lake Erie ports and the unloading onto the destination docks.

"When a boat has been named and the time it will be due at the port determined the coal is switched to the smaller yards at the docks where the machines are located that dump the coal into the vessel when it arrives. When the vessel is up to the machine ready to load, the cars are run onto the platform of the dumper, one car at a time. The machine lifts the car from 10 to 20 ft., as conditions require, and turns the car over, emptying its contents into a pan which permits the coal to run slowly through a cylindrical chute called a telescope, which is movable and by which the operator can turn the stream of coal to either side or part of the vessel desired within range of this telescope arm. This pan and telescope arrangement is to let the coal down easily into the hold of the vessel and thereby reduce breakage of coal to the minimum and also to trim the loading of the vessel. The largest of these dumping machines have a capacity to lift and turn over 40 to 44 cars per hour and will handle cars up to 100 tons capacity. We have 20 of these machines at Lake Erie ports for dumping bituminous coal, all but 3 of which are now in operation.

"As the occasion requires, the extra machines are put into service. The maximum dumping capacity of these machines is 375,000 tons per 24-hour day. The actual maximum dumping in one day at all ports was 4,401 cars, performed on Oct. 9, 1918. This was a total of 225,000 tons loaded into 27 vessels. These machines have dumped into vessels for cargo and bunker 1,453,684 tons in a week—the week of Sept. 25, 1922—and 5,043,887 tons in one month, the month of October, 1918.

"In 1922, when all mines north of the Ohio River were shut down for five months of the Lake season, April to August, there were forwarded during the months of September, October and November 12,852,000 tons, showing the capacity of the dumping machines as well as the railroads and the Lake fleets to handle large volumes of traffic when the emergency arises.

"This cargo coal goes to all the principal ports on Lake Superior and Lake Michigan, Georgian Bay, the ports on rivers and lakes from the Sault to Lake Erie and to ports reached through the Welland Canal and the St. Lawrence River, principally Montreal, to which point the tonnage is quite heavy, being used for railroad fuel, gas making, manufacturing, fueling river and ocean vessels and for domestic purposes.

"Lake coal is handled in bulk freight vessels of varying capacity, the larger running from 5,000 to 15,000 tons capacity. Vessels on the Great Lakes of less than 5,000 tons capacity are few in number and extremely small in proportion to the total capacity. At the opening of the season of 1923 the bulk freighters engaged in the coal, ore, grain and stone handling on the Great Lakes was 487, with total carrying capacity of around 3,500,000 tons per trip, depending upon the stage of the water in the rivers, channels and harbors. Four hundred and one of these vessels are of American registry, belonging to 33 fleets, and with one or two exceptions are all steel vessels.

"The aggregate carrying capacity for a season depends upon a number of factors: weather conditions, stage of water and dispatch in loading and unloading. The latter is

contingent upon promptness in receiving and discharging cargoes and is the most important factor, affecting the total carrying capacity of a vessel during the season more than any other item. The fleets of vessels on the Great Lakes, in my opinion, are the most highly efficient transportation facility on this continent. They handle more freight in a given time than any other transportation agency of like size and at freight rates that are so much less than the rail rates for equal distances that there is no comparison.

"The rates on ore from the head of the Lakes to Lake Erie, an average distance of something like 880 miles, runs from 70c. to 80c. per gross ton; the rate on coal from Lake Erie ports to Lake Superior ports is from 40c. to 45c. per net ton and to Lake Michigan ports from 50c. to 55c. per net ton. The rates on grain vary considerably from time to time during the seasons. From ports on Lake Superior and Lake Michigan to ports in Georgian Bay and in Lake Erie during 1922 they ran from 1¾c. to 5½c. per bushel, although higher rates than the latter figure were paid at times of scarcity of available vessels. An average rate from Lake Superior to Lake Erie of 3.42c. is reported for the season.

"The Great Lakes fleets carried during the last big season, that of 1918, 114,614,000 net tons of ore, coal, grain and stone. This was carried practically in 7 months and is as great a tonnage as is handled by many of the large trunk lines in twelve months. The ton-miles of the traffic handled in the bulk freight boats on the Great Lakes has been estimated at 92,000,000,000 ton-miles, which is about one-fourth of the total annual ton-miles for freight handled on the rail carriers of the country.

Fleets Meet War Emergency

"These great fleets have met every emergency. In 1917 there was a tremendous movement of ore and coal and in addition they were called upon to move an unheard-of volume of wheat late in the fall to supply the armies of the Allies in France. It took until Christmas Day in 1917 before the last vessel was in port; but they did what the government asked of them after battling almost constantly through ice from Lake Superior to Lake Erie.

"In 1918 the various war boards laid out a program on account of war requirements that was greater than any ever contemplated on the Lakes in any previous season. Notwithstanding the fact that the fleet was smaller than in previous season because a number of vessels had been taken out of the Lakes to the sea coast, all that was set up to be done was fully accomplished.

"In 1920, when the Northwest was in great distress over its winter's coal supply and appealed to Washington so vigorously that the Interstate Commerce Commission arbitrarily required the shipment of 4,000 cars—200,000 tons—of coal to the Lakes daily, to accomplish a total movement of 20,000,000 tons up the Lakes after Aug. 1, the vessels prepared to move it and did so to the full extent that they were called on to meet all the requirements of the Northwest docks.

"In 1922 the strike of the coal miners held back the Lake movement until about Sept. 1. The fleets were called on to handle over 13,000,000 tons from Labor Day to the end of the season. By organization, co-operation and co-ordination of every factor through the Ore & Coal Exchange the movement was fully completed before the season closed.

"The estimate of the traffic to be moved on the Lakes during the season of 1923, made prior to the usual time of opening of navigation was: Iron ore, 60,000,000 tons; bituminous coal, 25,000,000 tons; anthracite, 3,500,000 tons; fluxing stone, 9,500,000 tons; grain, 15,000,000 tons, a total of 113,000,000 tons.

"The unusual weather and ice conditions prevailing this spring much later than customarily, have delayed vessels and the movement of Lake traffic to such an extent that boats will not be running in a regular way before June. The later opening has cut down the carrying capacity of the fleets at least 10 per cent, and the reduced draft caused by low water stages in the channels, rivers and harbors likewise has reduced the carrying capacity of the fleets est mated, if this condition prevails throughout the season, at another 10 per cent.

"To give a better idea of the trip capacity of the Lake vessels and the rapidity of Lake transportation the following record cargoes and operations will be interesting: During the season of 1922 the Steamer 'Col. J. M. Schoonmaker' handled in one trip 14,336 tons of iron ore down and 14,500 tons of soft coal up on another trip. In the season of 1919, when the stage of water was more favorable, the Steamer 'D. G. Kerr' carried 15,532 tons of soft coal, and the 'W. Grant Norden,' a Canadian vessel handled 15,500 tons. The record of loading ore into vessels was made by the Duluth & Iron Range dock, Two Harbors, Minn., Sept. 7, 1921, when there were loaded into the Steamer 'D. G. Kerr' 12,508 gross tons of ore in 16½ minutes. This same cargo made the unloading record at the Bessemer & Lake Erie dock at Conneaut, Ohio, on Sept. 12, 1921, when the 12,508 gross tons of ore was lifted out of the vessel and loaded into cars in 3 hours and 5 minutes, or, at the rate of 4,056 tons per hour. The best record of loading vessels with soft coal is 13,976 tons of cargo and 369 tons of fuel in 4 hours and 30 minutes.

"When a vehicle of transportation can receive 14,000 tons of coal, transport it 880 miles, unload it, reload 14,000 tons of ore, transport it 880 miles, unload it, and perform all this in 192 hours, or exactly 8 days, there is no transportation and handling in the world that can be compared with it. Of course, this is not always the regular performance, but shows what has been done and could be possible under perfect conditions.

"Railroad transportation involves the haul of the coal from mines in the Pittsburgh and Connellsville districts of western Pennsylvania; the Fairmont, Pocahontas, New River and Kanawha districts of West Virginia; from mines in eastern Kentucky and in Ohio to the Lake ports.

"The coal at port on Monday morning of this week [May 21] was 14,347 cars and in the 48-hour transit report 5,601 cars, total of 19,948 cars. Back of coal shown in transit there is practically 5,000 cars moving from the mines to the scales or division points where the coal begins to show in the transit report. This means about 25,000 cars of coal under load daily with Lake coal. The amount of coal at port on Monday mornings is greater than other mornings in the week, the average coal at port should run around 10,000 cars. We dumped into vessels last week [May 14-19] notwithstanding the fact that we had bad weather conditions to contend with during two days of the week, 20,317 cars, or an estimated total of 1,035,000 tons, 46,000 tons of which was vessel fuel, thus bringing the total dumping of cargo and bunker fuel for the season up to 3,540,000 tons.

"The average loading of Lake coal prior to the season of 1922 was generally about 50 tons per car, but with increasing numbers of 70-ton cars and 100-ton cars the average loading per car is growing greater, and will run this season, from present indications, about 60 tons per car.

"All of this Lake traffic must be handled by the railroads within a season of practically seven months. In order to do this it is necessary to dump into vessels at Lake Erie ports an average of 3,000 cars of Lake coal and to furnish cars for and haul away an average of 5,000 cars of iron ore per day during the season. This necessitates the railroads operating days, nights and Sundays throughout that period.

"The railroads have a large undertaking to handle the 26,000,000 tons of Lake coal, including 1,000,000 tons of bunker coal furnished the vessels, and the 35,000,000 tons of iron ore during the season of seven months. In the emergencies the railroads have responded as wonderfully as did the vessels. Considering all the unfavorable conditions that have confronted the railroads they have made a splendid record in handling this Lake traffic for the past half dozen seasons and we hope for and expect no less satisfactory service this season."

Production of Coal in the State of New South Wales, Australia, during 1922 was 10,183,133 tons, according to A. Simpson, British Trade Commissioner at Sydney. This compared with 10,793,387 tons in 1921, a decrease of 610,254 tons. The making of coke was handicapped by the diminished smelting operations at Newcastle and Lithgow, production amounting to 240,229 tons, as compared with 592,097 tons in the previous year. There were 21,634 persons employed in the production of coal and coke, an increase of 369 over 1921.

Daily Output of Both Byproduct and Beehive Coke Higher in April

Output of byproduct coke in April, according to the Geological Survey, showed a slight decrease. The total production for the month was 3,206,000 net tons, against 3,256,000 tons in March. The fact that there was one less working day in April was responsible for the decline, as the average daily rate of production increased from 105,000 to 107,000 tons. The quantity of coke actually produced was 88.7 per cent of the capacity of the plants in operation, a percentage that compares favorably with that in preceding periods when demand for coke has been most active. Of the 70 byproduct plants, 64 were active and 6 were idle. One plant that has produced no coke for many months was reported permanently abandoned and being dismantled.

Unlike byproduct coke, the production of beehive coke increased slightly. The total output was 1,776,000 net tons, against 1,749,000 tons in March. It is of interest to note that of the total output of all coke, 64.4 per cent was contributed by byproduct plants and 35.6 per cent by beehive ovens, whereas in 1920 59.5 per cent and 40.5 per cent, respectively, were furnished by the two branches of the industry.

The present rate of production of all coke—4,982,000 tons—exceeds the average monthly rate in 1920 by 669,000 tons, or 15.5 per cent

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES *a*

(In Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,646,000	462,000	2,108,000
1922 Monthly average	2,374,000	669,000	3,043,000
February, 1923	2,810,000	1,482,000	4,292,000
March, 1923	3,256,000	1,749,000	5,005,000
April, 1923	3,206,000	1,776,000	4,982,000

(a) Excludes screenings and breeze.

To manufacture the coke produced in April it is estimated that 7,408,000 tons of coal was consumed, of which 4,607,000 tons was used in byproduct ovens and 2,801,000 tons in beehive ovens. From the table below it will be seen that the present rate of consumption is 16.7 per cent more than the average monthly rate in 1920, and 4.5 per cent more than that in 1918, when demands for war-time purposes were at their height.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE *a*

(In Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	2,401,000	706,000	3,107,000
1922 Monthly average	3,411,000	1,056,000	4,467,000
February, 1923	4,037,000	2,339,000	6,376,000
March, 1923	4,679,000	2,759,000	7,438,000
April, 1923	4,607,000	2,801,000	7,408,000

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens, and 63.4 per cent in beehive ovens.

Fuel Economy in Self-Firing

That human nature is the same in the army as in any other walk of life is clearly shown in a study made during the past year by the construction service of the Quartermaster Corps to determine what saving could be made by more efficient use of coal and wood at the various posts and stations where regular troops are on duty.

The records now indicate that the least coal is used where individual stoves are installed, and the most burned in central heating plants which care for the same number of people. Individual steam and hot-water plants come between these limits. As the construction service statement points out, "It compels the inference that the least coal is used when people have to fire for themselves."

This review of fuel allowances has borne great fruit in economy. One Western post had its allowance reduced 3,000,000 lb. from the amount used in 1921 and 2,000,000 from previous allowances. An Eastern post was reduced 1,000,000 lb.

Fuel for the army cost $10,274,502.19 in 1921, and in 1922 this amount was reduced to $5,877,897.98, a saving of $4,396,604.21.

British Columbia Coal Mining Grows Slowly

Coal mining in British Columbia is on a slow increase. The total coal production for the province in 1922 was 2,511,843 gross tons, valued at $12,559,215, making the aggregate for the province from the year 1836 approximately 59,205,333 gross tons with an estimated value of $213,768,998. The coke production for 1922 was 45,835 tons, valued at $320,845. This brings the total provincial coke production since 1895 to 4,228,536 tons, valued at $24,520,567. The coal output of last year was 27,848 tons in excess of that of 1921 and, with the exception of 1920, was greater than that of any previous year since 1912. The coke production of last year fell short of that of the previous year by 13,599 tons.

British Columbia's coal production for the years 1921 and 1922 may be summarized as follows:

	1921	1922
Vancouver Island Mines	1,625,931	1,754,656
Nicola and Similkameen Mines	183,153	270,890
Crow's Nest Mines	759,755	554,361
Omineca-Telkwa	800	1,008
Total quantity coal mined	2,569,639	2,580,915
Less made into coke	85,644	69,072
Net quantity of coal produced	2,483,995	2,511,843

Seventy-two per cent of the gross production of 1922 was mined by three companies, viz., the Crow's Nest Pass Coal Co., East Kootenay; the Canadian Collieries (D), Ltd., and the Western Fuel Corporation, the two latter of Vancouver Island. Other collieries figured as follows: Pacific Coast Coal Mines, Ltd., now in liquidation, mined no coal but recovered 4,752 tons of slack from one of the old dumps at the Morden Mines; the Nanoose Collieries, Ltd., produced 99,049 tons; the Granby company, from its collieries at Cassidy, V. I., produced 276, 919 tons; and King & Foster. operating at the Old Wellington, V. I., produced 9,148 tons. In the Nicola Valley section the Middlesboro Colliery Co. mined 69,330 tons; the Fleming Coal Co., 38,485 tons; the Princeton Coal & Land Co., 19,418 tons, and the Coalmont Colliery, 142 806 tons. In the East Kootenay, in addition to the Crow's Nest Pass Coal Co., which produced 508,339 tons, the Corbin Coal & Coke Co. had an output of 46,022 tons.

A new coal field has been opened up in the Omineca, northern British Columbia, where two small collieries are being developed on the Telkwa River. The Aveling Coal Co. shipped 669 tons last year while the Telkwa Collieries contributed 339 tons.

Canada's 1922 Coal Output Is 2 Per Cent Below Previous 3-Year Average

The Dominion Bureau of Statistics states that the output of Canadian coal mines in 1922 was 15,045,300 short tons, which is 2 per cent below the average of three previous years of 15,307,800 tons. Exports of Canadian coal were 1,818.582 tons, 82 per cent of the three-year average of 2.205,049 tons. Coal made available for consumption in Canada totalled 27,482,300 tons, a decrease of 14 per cent from three-year average of 31,736,800 tons.

11,359,000 Barrels of Portland Cement Produced During April

Production of portland cement during April, 1923, according to the U. S. Geological Survey, totaled 11,359,000 barrels, compared with 9.243,000 barrels in the corresponding month of 1922 and 9,880,000 barrels in March, 1923. Shipments for the month were 12,954,000 barrels, against 8,592,000 barrels in April a year ago and 10,326,000 barrels in March, 1923. Stocks at the end of April were 11,450.000 barrels, compared with 14,470,000 barrels at that period in 1922 and 13,045,000 barrels at the end of March, 1923.

Problems of Operating Men

Edited by James T. Beard

Failure of Fireboss Cannot Be Ascribed to His Lamp

Careless Acts of Firebosses Often Cause Disaster Attributed to Failure of Safety Lamp—Exact Information Too Often Lacking

WITH more than ordinary interest, I read the letter of W. H. Moore, *Coal Age*, Jan. 25, p. 184, entitled "Relative Safety of Safety Lamps Under Varying Conditions in Mines." The letter gave a brief description of an explosion that occurred in the Wakesiah mine, Nov. 24, 1922, and which cost the lives of the fireboss and a pumpman.

From first to last, there has been much said in *Coal Age*, in regard to the use and safety of the testing lamp in coal mines. Having had a long experience in the use of the Wolf testing lamp, I consider it safe if properly assembled and carefully handled, under ordinary working conditions. Neither this lamp, however, nor any other testing lamp with which I am acquainted, is absolutely safe if carelessly exposed to a highly explosive mixture of gas and inflammable dust carried in a current moving with a high velocity.

Firebosses frequently do very careless things while using the safety lamp. In the event of an accident when the actual circumstance is not known it is generally charged to the failure of the lamp, instead of being attributed to carelessness on the part of the fireboss. The Wolf testing lamp, I believe, is safe for the purpose for which it was intended. So are many other instruments. A revolver is a safe weapon in the hands of a careful and experienced man, but would be a dangerous plaything in the hands of a thoughtless boy.

Movements of Fireboss Not Made Clear

Returning, however, to the account of the explosion as given by Mr. Moore, it does not make plain to me the exact movements of the fireboss after he had connected the hose to the air-line pipe on the slant. Did he then take the hose up the slant, carrying his lamp with him, and attempt to adjust the hose at the face so that it would blow down the slant? This being done, did he now take his lamp and, going back, turn on the compressed air in full force? Then, with his lamp in his hand, did he again advance up the slant against a highly explosive mixture, to within 21 ft. of the end of the hose when the explosion occurred?

If we are to understand that was his proceedure, I must say it was not only a most careless but a highly foolish act for an experienced fireboss. It would seem to me likely that to carry a lamp against such an explosive mixture traveling at a high velocity, would result in the lamp being put out or the explosion occurring before the point was reached where the lamp was found lying in the passage, after the explosion.

It is stated that the fireboss was killed by the force of the explosion; but it is not explained how he could have gotten 84 ft. away from his lamp. Without information as to how the man's lamp was found 21 ft. from the end of the hose, and his body 105 ft. from the same point, one is led to assume that the order of his procedure may have been as follows:

Having connected the hose to the air-line pipe and taking it and his lamp, the fireboss went up the slant, for the purpose of adjusting the hose at the face as he did. Setting his lamp down 21 ft. from the face or end of the hose, so that he could properly adjust the hose by the light of the lamp, and leaving it setting on the bottom, he goes back and turns on the compressed air without ever thinking of his lamp. Returning up the slant, the explosion occurred when he was 84 ft. from where he had left the lamp.

Overheated Condition of Lamp Probable

Mr. Moore's suggestion that as the lamp had been used several hours previously for illuminating purposes it was overheated, I think is both logical and correct. Let me add, that to get more light by which to work, and in his hurry changing the hose, the man may have raised the flame of his lamp and forgotten it, while the heat of the already overheated lamp was increasing. Coming in contact with an explosive mixture traveling under high pressure, would be more than any testing lamp could be expected to stand in this heated condition.

Mr. Moore does not inform us as to the experience and competency of his fireboss. I presume, however, the man held a certificate of competency granted him by an authorized examining board. But, doing as it appears likely he did do, the result would have been the same had he possessed a pocket full of certificates.

In closing, I wish to say that I am not criticising Mr. Moore, further than that he seems to ascribe all the blame to the assumed failure of the safety lamp, and none to his fireboss. Just here, let me emphasize this thought, rules of safety, unless strictly practiced, and safety lamps, unless carefully handled and properly used, will not insure protection to life in coal mines.

JOHN ROSE,
Former District Mine Inspector.
Dayton, Tenn.

Where Mine Foremen Too Often Fail

Many mine foremen rely too largely on their assistants —Efficiency requires personal supervision of the work—Assistant foreman often lacking in needed experience.

SINCE reading many letters in *Coal Age* where reference is made to foremen who have failed to make good, I am prompted to offer a few remarks on this important subject. A mine foreman holds a most responsible position and on his success or failure depends the future successful operation of the mine.

Close observation, extending over a long period, and a study of the habits of a large number of mine foremen have brought me to the conclusion that the chief cause of many failures on the part of foremen is the fact that they rely too largely on their assistants. Strange as it may seem, mine foremen will often leave the planning and carrying out of the work entirely in the hands of assistants.

Without casting any reflections on the well meaning and faithful work of many of these assistants, it must be said that, in too many instances, an assistant foreman lacks the needed experience to enable him to plan the work and give the necessary instructions to the men in his charge. It is just here that the need of an efficient mine foreman is much felt.

Supervision by Mine Foreman Needed

Efficiency in mine management underground requires the constant close supervision of every branch of the work, by the mine foreman himself. On his shoulders alone should rest the responsibility for the successful planning and prosecution of the work. It is not enough that he has faithful assistants, who are each put in charge of work in different sections of the mine. A good foreman will, himself, look constantly after the work, thus aiding and encouraging each assistant foreman in the performance of his work.

More than once, have foremen come under my observation who seldom ever left the bottom of the shaft. From that point, generally, they would assume to direct the work and issue orders to their several assistants. If they did leave the bottom for a time they would hardly ever get farther into the mine than to some parting where they would sit down and remain until they got ready to return to the bottom for the balance of the day.

Reports, coming from reliable sources, have informed me that two months would frequently elapse between the visits of a head foreman at the working face of a mine. No argument is needed to show that work of this kind, on the part of the foreman in charge of a mine, is a real handicap. Instead of assisting the production of coal, a foreman of this type is an absolute hindrance. The mine would do better without him.

Influence of Foreman's Example

In plain words, a foreman of the kind I have just described is lazy and of no value to the company who employs him. Yet, we often see such foremen retain their positions for years. In every case, the company appears to be perfectly satisfied and seems to think that the foreman is doing the best that can be expected of him. It is an enigma to me how such men can hold their jobs. Should they ever get a position in another company it is certain they would have to change their tactics in order to hold their places longer than a few days or months, at the most.

It goes without saying that such foremen are failures. A lesson I learned long ago is that when a mine foreman shifts his responsibilities onto the shoulders of his assistants he is bound to fail and, sooner or later, the results of his inefficiency will be clearly seen by practical men in touch with the mine where he is employed. If the management of the company fails to see his shortcomings it is because their eyes are closed to his faults.

As I said before, assistant foremen, however faithful in the performance of the work allotted to them, cannot be expected to perform the same tasks and assume the responsibilities of the mine foreman. That official should have a wider experience, which would fit him for the larger duties of his position. For this reason, it is a mistake for a foreman to fail to supervise the work of each of his assistants and give them the benefit of his more mature judgment and experience.

Advantage Gained by Close Supervision

By so doing, he will assure his own success as foreman, and the force of his example will inspire every worker in the mine. The cost of production of coal will be decreased, as a result of the close supervision which every intelligent foreman gives to the work in his charge. Not only that, but the same pleasing results will be manifest in the pay envelope of every worker in the mine.

One word more and I am done. I want to say many foremen seem to think that, having obtained their certificates, they need not exert themselves to learn more. They should remember that coal mining is very much like a progressive plant, requiring constant study and reading, together with hard work to keep oneself up to date on the latest improved methods and equipment.

Hillside, Ky. O. Kennett.

Draining Gas from Seam by Sinking Boreholes from Surface

Effect of water in borehole to prevent escape of gas—Holes drilled at intervals on line of entries—Casing pipe extended above surface.

In looking over a few back numbers of *Coal Age* the other day, my eye caught a letter written by an inquirer, in which he mentioned having tried sinking boreholes from the surface to drain the gas from a coal seam, in order to prevent the sudden outburst of gas in the mine, which had occurred at frequent intervals. Thinking the matter over, it seemed to me that the inquirer had overlooked one thing that was probably the cause of his getting poor results by this method.

As far as I know, mention has never been made of the effect of water standing in the borehole and preventing the escape of the gas coming from the coal seam or the overlying strata as the case may be. To my mind, when water stands in the hole to a considerable depth, it must form an obstacle and obstruct the flow of gas from the seam.

High Pressure of Gas Caused Outbursts

In the instance referred to by the correspondent, the gas in that seam was under a considerable pressure and was the cause of sudden and severe outbursts in the mine, throwing down tons of coal in the entries and filling the mine with gas and dust. It was to avoid these outbursts of gas that boreholes had been sunk from the surface, at points ahead of the workings, in the hope of draining the gas from the seam and reducing its pressure to a safe amount.

Allow me to suggest, in this connection, that it would be well to sink the boreholes to such a depth below the bottom of the seam as would hold the water accumulating in the hole and prevent its obstructing the flow of the gas from the seam or overlying strata. In order to determine the necessary depth of the holes, previous careful measurements should be taken to ascertain the amount of water standing in the hole before starting to drill to a greater depth.

In order to obtain good results, these boreholes should

be drilled at regular intervals, not more than 1,000 ft. apart, on the line of the main entries; and the same system should be followed over each pair of cross-entries. If there are abandoned workings in the mine, every effort should be made to push the work of drawing pillars and entry stumps, so as to induce a general fall of roof in such places, which will assist in relieving the great pressure of the gas.

Before closing, allow me to suggest that all boreholes drilled from the surface, for the purpose of draining gas from the seam below, should be cased and the casing pipe extended from 8 to 10 ft. above the surface. This will prevent the hole from becoming obstructed by earth and other matter falling into it, or by mischievous persons filling it with stones, dropping them into the hole. I would also advise fencing in these holes by a substantial enclosure with a suitable warning to persons not to interfere with the pipe. OSCAR H. JONES.

Wilder, Tenn.

Inquiries Of General Interest

Cripple Creek Drainage Tunnel

Pumping in Individual Mines Fruitless—Drainage a Joint Problem in the District—Many Mines Derive Benefit

PLEASE advise through the columns of *Coal Age* what is the longest tunnel driven for drainage, in mining districts, stating where it is located and the number of mines drained. P. A. Z.

Santoy, Ohio.

Inquiry in different mining districts has elicited the fact that probably the longest drainage tunnel, driven for such purpose, in this country, is that known as the "Cripple Creek Drainage Tunnel," which was started early in the year 1903 and practically completed the following year.

The problem of mine drainage had grown to be one of vital importance in the Cripple Creek district, where the flooding of many mines had caused their temporary abandonment. The matter was finally brought to a head by trying experiences in the Elkton, and other deep mines. It was found that pumping operations in those mines resulted in handling the water from a large number of other mines in the vicinity. Investigation showed that the drainage area was of considerable extent, which made the question of mine drainage in the entire district a problem of joint interest.

COMMITTEE OF MINE OWNERS APPOINTED

A committee was therefore appointed, representing the mine owners of the district, to look into the matter. Their report showed that the general water level in the mines had an altitude of practically 9,000 ft. above sea level. Several plans were discussed, the two main propositions being the sinking of a shaft and the erection and operation of a large pumping plant capable of handling the water from the district; as compared with the driving of a long drainage tunnel to accomplish the same object.

The comparative cost of these two propositions favored the latter scheme. The length of the proposed tunnel was about 10,000 ft. and the work was estimated to cost in the neighborhood of $300,000. The question of financing the scheme, however, was one of minor importance, in a district where the yearly production of gold amounted to $20,000,000 worth of metal. Moreover, it was realized that the results growing out of the work of driving the tunnel would not be confined to the question of draining the mines, which was the object in view. Incidentally, the geological information obtained by cutting across the strata would be of the greatest interest, in showing the continuity of the veins and ore bodies in respect to depth, and much other information that would be of value in the district. It was not unreasonable to assume that many new ore bodies would be discovered during the progress of the work.

Owing to the extent of the drainage area in the district, it is impossible to state how many mines derived a permanent benefit when the work was completed. The results were general throughout the region. We shall be glad if *Coal Age* readers can give further information regarding this or other drainage tunnels, here or elsewhere.

Blue Flame at Finger Tips

Static charge from engine belt, due to friction, appears as bluish flame at finger tips—Effect caused by rarefying of the air—Appearance similar to blue vault of the heavens.

KINDLY explain through the interesting columns of *Coal Age*, what is the cause of the appearance of a blue flame at the finger tips when one extends his hand toward the rapidly moving belt of an engine driving a generator or other machine. There is, at the same time, a prickling sensation felt, but the fingers are not burned or otherwise harmed. The experience is a new one to me, and one that I fail to understand.

Stillwater, Ohio. J. H. BLAIR.

The bluish appearance here referred to is not a flame or the fingers would be burned. It is a halo caused by or resulting from a local rarefication of the air, due to the passage of a static electrical charge from the belt to the hand held with fingers pointing toward it. As in all electrical devices, the intensity of the charge is greatest at a pointed end, which seems to have an increased power of attraction. This intensity at the finger tips may be assumed to produce a local effect to give the air a bluish tinge similar to the blue sky of the rarefied upper atmosphere.

An engine belt driving a heavy machine of any description and running at a high velocity will often become highly charged with frictional electricity. The static charge flows continuously from the belt to the finger tips that attract it; but the intensity of the charge is not sufficient to produce a spark. The bluish halo can be seen best in the dark or a subdued light.

The friction of the rapid belt in the surrounding air and, in part, to slippage on the pulleys, is what creates the electric charge. A similar static charge is produced when the hand is rubbed over a sheet of paper, or when a person, in slippered feet, moves about briskly over a new brussels carpet. On a dry, cold day, the writer has frequently lighted a gas jet by this means, touching the burner tip with his fingers and producing a spark that ignited the gas.

Examination Questions Answered

Examination for Mine Examiners Springfield, Ill., Mar. 19, 1923

(Selected Questions)

QUESTION—*What is the law as it applies to air currents and splits?*

ANSWER—The Illinois law (Sec. 14-b) requires the main air current to be divided, so as to give a separate current to every 100 men at work; but the mine inspector is authorized to order, in writing, separate currents for a smaller number of men, when he deems this necessary. The same section (a) authorizes the mine inspector to require, in writing, a larger circulation of air than 100 cu.ft., per man per minute, and 500 cu.ft., per mule per minute., in non-gaseous mines, or 150 cu.ft., per man per minute, in gaseous mines, if conditions, in his judgment, require such increased quantities.

QUESTION—*Why is the air split in mines?*

ANSWER—The purpose of splitting the air current in a mine is, chiefly, to afford a better distribution of the air, according to the need in each section of the workings, and to give to each section purer air than when the current is carried from one section to another continuously. A local explosion of gas or dust occurring in one section of the mine may not be transmitted to another section ventilated by a separate air split. Also, dividing the air reduces its velocity and not only requires less power for the circulation but provides safer conditions at the working face.

QUESTION—*Is it proof of good ventilation, in a gaseous mine, when a very rapid current of air is passing through a small airway? Give reasons.*

ANSWER—A rapid current passing in a small airway indicates a high velocity of the air, which is a dangerous factor in the ventilation of a gaseous mine, because of the danger of the high velocity of the air current forcing the flame of a safety lamp through the gauze. Moreover, the high velocity of the air current will cause it to carry a greater quantity of dust in suspension than where the air is made to travel at a lower velocity, by enlarging the sectional area of the airway.

QUESTION—*With a temperature of 32 deg. F., what is the weight of a cubic foot of air when the barometer reads 29.2 in.?*

ANSWER—The weight of a cubic foot of air, under these conditions, is given by the formula,

$$w = \frac{1.3273B}{460 + t} = \frac{1.3273 \times 29.2}{460 + 32} = 0.07877 \text{ lb.}$$

QUESTION—*What are the laws in reference to persons seeking a certificate as mine examiner?*

ANSWER—Section 2 (f) of the Illinois mining laws requires each applicant for a certificate to produce satisfactory evidence that he is a citizen of the United States, twenty-one years of age, of good repute and temperate habits and having at least four years practical mining experience. He must pass an examination regarding his experience in mines generating gas and his knowledge of the nature and properties of firedamp, laws of ventilation, construction and use of safety lamps and the laws relating to safeguarding the mine against fire. He must also possess a knowledge of first-aid to the injured and mine-rescue methods.

QUESTION—*What are the duties of a mine examiner?*

ANSWER—Section 21 (b) of the Illinois law requires the mine examiner to examine the underground workings, in his charge, within eight hours previous to the time for the dayshift to go to work, each day that the mine is to be operated. Where an air split generates gas in dangerous quantity the examination must be made within six hours of that time, provided the mine inspector, in his judgment, does not require a still shorter period for the examination. In mines where electric lamps are used exclusively, the law requires the examination to be made within four hours of the time for the dayshift to enter the mine.

The examiner must carry with him a safety lamp, in good order, and a rod or bar for sounding the roof. He must see that the air current is traveling in sufficient quantity in its proper course. The law requires the examiner to measure the air passing at the last crosscut in each pair of entries, or the last breakthrough in a section, in longwall mining, and at other necessary points and note these measurements in a book kept for that purpose. He must inspect all places where men must pass or work, and observe any dangerous roof conditions or bodies of accumulated gas. He must examine all roadways and air-courses, together with the accessible part of recent falls and old gobs.

As evidence of his morning examination, the examiner must mark with chalk the date of his visit, in a suitable place on the wall, but not on the face of the coal, in each place examined. Where danger is found, he must mark the place plainly, as a warning for men to keep out, placing two obstructions across the road, not less than 20 ft. apart, one being outside of the last open crosscut, in any place where a body of gas is found. He must record the results of his examination in a book kept for that purpose, when completing his work each day, and take possession of the entrance checks of men in whose places danger has been found, giving such checks to the mine manager before the men are permitted to enter the mine.

QUESTION—*How would you remove firedamp from the face of an entry, the face being 50 ft. inside of the last open crosscut?*

ANSWER—Before making any attempt to disturb this gas, all the men working on the return airway, or the return of this air split, must be withdrawn and every approach to the return current of that section properly safeguarded, to prevent men from entering the current. This being done, a line of brattice must be carried from the outby corner of the rib of the last open crosscut and extended up the entry, by adding short lengths of brattice as the gas is removed. The line of brattice must be set about two feet from the right-hand rib when facing the head of the entry, so that the intake side of the brattice will have the smaller area. Only experienced men must be employed in this work and frequent tests must be made with an approved safety lamp to ascertain the progress of the work. No open lights must be allowed in any portion of the entry. When the gas has been cleared from the face of each entry the mine examiner must then make a thorough examination of the entire section, on the return of this current, before permitting men to enter for work.

Gray Silver and H. L. Stimson to Speak At N. C. A. Convention

An address by Gray Silver, president of the American Farm Bureau Federation, will be the principal event of the Wednesday session of the annual convention of the National Coal Association, which will be held in Atlantic City beginning June 19. There will be no general session on Tuesday, however, for that day will be given over to the state and districts meetings. Delegates will register on that day and the directors will meet at luncheon at the Hotel Traymore.

In addition to Mr. Silver's address on Wednesday morning President Ogle will make his report, as will Executive Secretary Gandy. The Cost Accounting Committee and the Credentials Committee also will submit reports.

On Wednesday night there will be vaudeville acts and a boxing match at the North Side Athletic Club.

The principal address on Thursday morning will be made by Colonel Henry L. Stimson. J. C. Brydon will acquaint the delegates with the work which has been done by the Bituminous Operators' Special Committee and C. E. Bockus will tell of the work of the Publicity Committee. A letter from Senator Stanley, of Kentucky, will be read at this session. On Thursday morning also reports of the election of directors from the various states and the nominations of directors at large will be received.

"The Poison in a Democracy" is the title of an address which will be delivered on Friday morning by Colonel Guy D. Goff. At this session the directors at large will be elected. Immediately thereafter the new board of directors will retire for an organization meeting. The incoming president will be introduced. Reports will be presented by the Railroad Relations Committee and by the Finance Committee.

Wadleigh Reports Spotty Conditions in Principal Bituminous Coal Fields

F. R. Wadleigh, Federal Fuel Distributor, on June 12, gave out a survey of transportation, distribution and labor conditions in the principal bituminous coal fields as of June 1, indicating that the market throughout the country is spotty. Colorado operators are convinced that with the conditions existing nothing can prevent an abnormal demand this fall and winter. In Illinois there is almost no movement aside from a large tonnage of steam coal and railroad fuel. The mines in Indiana are being operated at approximately 45 per cent of capacity, but there is no scarcity of coal. Car supply, taken as a whole, is not bad.

Consumers of western Kentucky coals are storing some, with car supply and movement generally good. Mine-run coal can be purchased from 25c. to 50c. per ton less than the cost of production. The mines in northeastern Kentucky are operating on about a 38 per cent basis, the loss of time being due to shortage of transportation facilities. This district has not felt any noticeable reflection of the "no market" condition, because a great volume of this coal is used by the steel industry, byproduct coking and gas plants. The market in the eastern Kentucky fields is rather dull, demand being for the better prepared coals. Some of the high-cost production mines have closed down.

Reports from New England show an inactive buyers' market with about 60 days' stocks on hand, exclusive of railroads. All embargoes have been removed and there is only slight congestion at the junction points.

The Somerset County (Pa.) district reports little change in market conditions, but a better demand for the higher grades of coal. Car supply, however, is better.

The demand from the West for Pocahontas district coals is better than the Eastern, Southern or export markets. Some concern is felt over the apparent hesitancy of consumers of household coal to take in the proper amount of domestic sizes. Tug River district conditions are good, with a brisk demand for tide and westbound coal. The markets of the Fairmont field are absorbing a record tonnage from this section. With the free movement of tonnage and the return of ideal conditions from the standpoint of the consumer, some 100 inefficient mines, or mines producing inferior coal, have permanently closed down, enabling the railroads to distribute cars to the mines continuing operation.

Logan County district market conditions are reported as poor, and most operators shipping on contracts only. Some of the mines in the Kanawha district on both the C. & O. and New York Central lines have shut down, giving as their reason that the prices which may be obtained are not sufficient to permit operation except at a loss. There is still a strong demand for more New River coal that can be produced under present car-supply conditions.

The outlook for coal in the Northwest is good. Some industries, while not buying heavily, are closely canvassing the situation, and other industries are buying from hand to mouth.

The production of anthracite is being pushed as hard as labor conditions will permit. Distribution is going forward regularly, preference, of course, being given to northern New England and the territory served by the upper Lake docks, where movement must be completed before it can be interfered with by adverse weather conditions. The storage yards of the operators are bare of domestic coals, as also, generally speaking, are the yards of the dealers, the latter delivering coal to consumers as soon as they receive it.

Midwest Retailers Resent Questionnaires As Discriminations Favoring Snowbirds

The annual meeting of the Midwest Retail Coal Association opened June 5 at the American Annex Hotel, St. Louis, with an attendance of seventy-three. L. P. Coan, president of the Coal Service Bureau of St. Louis, welcomed the dealers to St. Louis, and H. F. Shrankler, president of the association, responded.

The program included a talk on "Automatic Conveying Machinery," by A. L. Shaw, of the Chicago Automatic Conveyor Co., after which several questions were asked and answered.

A paper on "Coal Storage" by C. G. Brinley, of the Gifford-Wood Co., developed an interesting discussion, in which Mr. Kelly, of Springfield, took a conspicuous part. H. S. Mitchell of the Coal Credit & Correct Weight Bureau, Kansas City, spoke on claims and claim problems from the viewpoint of those having an association through which to collect them, while H. R. Oglesby discussed the problem from the standpoint of the small-town dealer.

After a spirited discussion this resolution was adopted:

"Resolved, That the request of the Coal Commission that retail coal dealers answer questionnaires is unreasonable, unjust, is an illegal request and is a rank discrimination against honest business men in favor of dishonest coal agents and jobbers, commonly known as snowbirds;

"Be it therefore, further resolved that to be constitutional a law or statute must not discriminate, and it is not lawful to make an honest coal merchant go to trouble and expense in furnishing a history, for a ten-year period, of his business and to further compel him to keep books that will quickly furnish to any investigator the status of the business of such dealer, and all this because this dealer invests money in land, buildings and necessary equipment to properly conduct a coal business and to carry coal in storage for the protection of his community during strikes, blizzards and other contingencies, and

"Whereas, This same dealer has competition that has no investment, pays no license or taxes, keeps no books or records, has no established place of business, but as a rule is dishonest, unfair, incompetent, ignorant of coal knowledge and conditions, and destroys public confidence in honest tradesmen who sell coal of good quality at a fair price, by misrepresentative advertising, who incites public unrest and prevents the spring and summer buying of coal by false and ignorant rumors of lower prices to come;

"Be it therefore further resolved that we protest against any reports being furnished from retail coal dealers properly equipped and of legal and financial responsibility to any commission for any purpose whatever while the retail coal trade's unfair and unreliable competitor and the wholesale distributor for whom the local distributor is often an agent is not forced to furnish the same data requested of the dealer."

Stabilizing Effect of Concentrated Ownership on Supply And Price of Anthracite Impresses Commission

By Paul Wooton
Washington Correspondent of *Coal Age*

While members of the President's Coal Commission are being particularly careful not to anticipate any of the conclusions which may be reached in the anthracite report, it is difficult to see how they can avoid passing on two great industrial problems—competition versus centralization and what procedure is to be followed when labor and capital fail to reach an agreement. In all industry there is no better illustration of highly concentrated corporate ownership and of runaway competition than is afforded by the anthracite and bituminous mining operations in the United States.

The commission's study has brought out clearly the stabilizing effect of this concentrated ownership on supply and price. The members of the commission, it is known, have been impressed with the success of the anthracite producers in preventing a runaway market during the past winter, through their control over the bulk of the tonnage. Such flurry as there was can be blamed on the competition that does exist, many believe. There are some who believe a majority of the commission would oppose any effort to break up the closely knit business organization which produces most of the anthracite. They may have some suggestion in their report as to the means which can be employed to prevent possible abuse of this control. It is difficult to imagine how the commission can make a report on anthracite coal without passing on the merits of that type of control. In the bituminous-coal industry many things can be done which would improve the situation, but in anthracite the outstanading questions are two—centralization and labor relations.

The situation in the anthracite field is such that it seems highly probable that the report will have some suggestion as to what additional machinery is to be set up for use when the operators and the mine workers cannot reach an agreement. In anthracite each side is 100 per cent organized. The employees present a homogeneous front and the operators are always in step. For nearly twenty years their differences have been handled in a fairly satisfactory manner through the existing machinery, but it is recognized that it is not adequate when a major difference occurs.

How Anthracite Deadlocks Are Settled

When a deadlock occurs under present conditions the two parties to the controversy either fight it out or voluntarily agree to some form of arbitration. In the former case the public frequently is denied adequate fuel supply while the contestants engage in the fighting out. Arbitrations in the past usually have been undertaken after great losses have been suffered and after coal production has been long reduced. None would be surprised if the Coal Commission were to prescribe the exact form arbitation would take. It may not go so far as to make arbitration compulsory, but it may have some plan whereby the arbitrational machinery is expected to begin to function immediately when a deadlock is reached, with reliance placed on the force of public opinion to bring about its use.

Chairman Hammond stated Saturday that the commission is wrestling with the valuation problem. The situation with regard to valuations is affected importantly by recent decisions of the Supreme Court of the United States. He admitted that the public will be critical of the valuations used in the computing of profits in the anthracite industry. The report of the special advisory committee on valuations had not been received on that date, however. Mr. Hammond brought out that it is unfortunate that the law prescribes an exact date for the issuance of the anthracite report. If the commission had three weeks more time a more complete report could be made, he stated. He admitted, however, that the commission has had before it for some time a large enough proportion of the returns from the industry to enable members to form conclusions contingent on corroboration by the remaining returns covering the full tonnage. The report made by Senator Pepper on the legal aspects of royalty regulation has been received.

The commission is going minutely and carefully into the whole question of the check-off, Mr. Hammond revealed. He admitted that it would be interesting to know in detail the use which the Mine Workers makes of its revenue. He gave no intimation, however, that any such request would be made or that union officials would be asked as to the alleged use of large funds at Herrin.

Illinois Mining Institute Studies Safety and Other Mine Problems on Boat Trip

A boat trip from St. Louis up the Mississippi and Illinois rivers to LaSalle, Ill., and back, with a fare of geology, roller-bearing problems, fried fish, mining methods, jollity, "down South" hot biscuits, hot discussions, mine safety schemes and appliances, long sleepy rests on deck, jazz music and a conglomeration of other things marked the summer convention of the Illinois Mining Institute June 7-9. About seventy-five men made the trip, absorbed some new ideas, had a vacation that was good though short, and went home looking forward to next summer. For five years the Institute has made such a boat trip, and combined pleasure with a technical program, often resulting in real contributions to the science of coal mining.

This year the convention noted with sadness the absence of the late Prof. H. H. Stoek, of the University of Illinois, a mining engineer whose influence and activity in the Institute had been marked. Also it noted the absence of J. B. Hebenstreit, of Nokomis, Ill., a charter member who is seriously sick. On the afternoon of the second day, as the Institute's steamer, the Piasa, touched at Peoria, a telegram of sympathy and good will was dispatched to the sick man from the group of engineers, state mining officials, coal operators and machinery and equipment men aboard. John G. Millhouse, president of the Institute and Martin Bolt, secretary, conducted the technical sessions and otherwise arranged and engineered the outing.

The very first subject on the Institute's program proved a live one which brought many a man to his feet earnestly. It was mine safety—how to protect men's lives and limbs in spite of their carelessness, ignorance or bullheadedness, and how to protect mine property in spite of difficult conditions. The question came to the fore in a paper written by George H. Dieke, president of the Mine Safety Appliances Co., and read by J. R. Fleming, of St. Louis. The paper treated first the broad proposition of safety in a general way and then got down to detail concerning the principles, the construction and the service of some modern appliances such as the electric cap lamp, masks and rescue outfits, gas indicators, carbon-monoxide detectors to replace canaries and mice, and an inhalator which resuscitates by injecting into a gassed patient a mixture of 95 per cent oxygen and 5 per cent carbon dioxide, making him breathe deeply and bringing him around often without the usual complications of pneumonia, violent headache and the like.

Following the paper, J. E. Jones, safety engineer for the Old Ben Coal Corporation and a man who always is counted on to contribute something worth while to any safety discussion, said that it is strange that in Illinois, in spite of all the safety effort and mechanism of today, the death rate per 1,000 men employed is just as high as it was between 1882 and 1892, the first decade of safety statistics in the state. An average of 3½ lives per 1,000 men per year are sacrificed today, as was the case then. The fatalities per million tons produced have decreased, however.

To his way of thinking, safety effort should be devoted 95 per cent to preventing accidents and 5 per cent to such after-work as first aid and mine rescue. The main thing to do is find causes and eliminate them. Replacing black powder with permissibles was one great step. Using enclosed lights even in non-gaseous mines was another. An open-flame lamp in a non-gaseous mine was the cause, he said, of the terrible Cherry mine disaster in Illinois in 1910.

Much could be done, he thinks, to cut down accidents at faces. It is criminal, in his opinion, to put a loader up against a face that has been undercut and shot but which is hanging loose. Another cause that could be remedied is the taking of miners from their accustomed jobs and putting them on company work. When a man is taken from the face and set at trip riding, trouble may be expected. Men should be trained for their particular jobs and then kept on those jobs. Factories, he said, do an infinitely better job of training their men than do coal mines.

"Few first-aid men get hurt," commented D. D. Wilcox of the Superior Coal Co. "Why is that? We feel that it is because a man gets to thinking safety until precaution with him is natural. If all men could get that attitude of mind, a great advance would have been made. But nowadays in Illinois men don't seem to know whether they are working for the company that pays them or for the union. Union leaders and wrong-headed fellows, too often say that the company wants to teach men safety just to save company money, and the result is that a man may be prejudiced against safe practice. It's true the company wants to save money, but it also wants to save its men's lives and legs and hands and collarbones."

He granted that careful and proper timbering would prevent many roof falls, but it is mighty difficult to tell just how to timber to meet varying conditions of roof and overlying strata. Injuries at the face, he thought, would be reduced if coal were shot down properly and never left overhanging.

Favors Change in Law Requiring Certificates

J. H. Haskins, a state inspector, favored a change in the law to require miners to earn first-aid certificates before they could be certified for work by the state examining board.

"Co-operation between man and company is essential," contributed Frank Tirre, of St. Louis, thereby precipitating a discussion which struck a little fire here and there. Martin Bolt, assistant director of the State Bureau of Mines and Minerals and secretary of the Institute, caused the first flash.

"Proper mining rules properly enforced is the main thing needed to prevent accident," declared Mr. Bolt. "There's no other way to reduce minor accidents. There's a marked lack of enforcement by companies and mine superintendents, and all of you know it. It isn't that you superintendents haven't got horse sense and backbone. It simply is that you don't take the trouble. Tell the rule breakers they must obey or get out, and tell it so that what you say will be heard clear up to the international officers of the union."

He said, further, that too many companies fail to take safety to heart. They pay an insurance company a specified amount of money to watch out for such things and then feel they have done their duty. He thinks companies should encourage their men to study rescue work and send teams to rescue meets and all that sort of thing. J. A. Jefferis, of St. Louis, said his company offered to pay the expenses to a Springfield training course for all the employees who wanted to go. Only six went. Others declined unless the company paid them day wages while they were studying. His experience is that men expect the company to meet them not half way but all the way. Peter Grant, Jr., of Peoria, said he thought better feeling and mutual understanding could be had between men and company if the company took a hand in educating them along many lines.

Replying to Mr. Bolt's frank suggestion to mine superintendents, Mr. Wilcox said superintendents can't fire miners right and left for every little offense. It often would be better to keep the offender and train him better, rather than fire him and spend a lot of time breaking in a new one. Anyway, a superintendent can't be beside every man all the time. He can't see most of the rule infractions for that reason.

A novel and original system of mining on a retreating basis was explained in a paper by Joseph Lord, of Peoria. Mr. Lord explained a diagram of underground layout which he said could be developed to produce almost any amount of coal up to 24,000 or more tons a day. He would run eight triple main haulageways from the center of a square area out diagonally to the corners and out at right angles to center points on each boundary, and the whole area cut into 32 long blocks by branch entries, all driven clear to the boundaries of the property.

Mining this coal by the retreating method, each block would have two faces pointing the outer end of the block into "V" shape. Since each block would be 1,320 ft. wide, each of the two faces would be 870 ft. long. A mining machine could make a continuous cut along each of the 870 ft. faces, the coal shot down and then a trip of 40 cars on a track laid parallel to the face could be loaded with great dispatch either by hand or by mechanical loader. Hoisting would be through a double-deck four-track slope rising from a bottom close to the center of the property.

Mr. Lord declared that the output of such a layout would be almost unlimited, ventilation would be more nearly perfect and damage by an explosion would be less because of greater space for pressure escape, extraction would be practically complete by a system of caving down the roof, and the greatest possible tonnage would be obtained at the least possible cost.

The Institute devoted close attention to a discussion on the geology of Illinois coals by Harold E. Culver, who has been working under the co-operative agreement in Illinois in an effort to determine just what the coal resources of the state are and to work out a method for recognizing each seam as it is encountered.

On the second day of the trip as the boat was passing through the region above Peoria, M. M. Leighton, newly appointed chief of the Illinois Geological Survey, succeeding F. W. DeWolfe, who resigned last spring, talked absorbingly to the Institute about the geology of the locality, whose surface they could see from the boat's deck.

A discussion of roller bearings followed a paper by P. B. Liberman, engineer of tests for the Hyatt Roller Bearing Co. of Newark, N. J. Mr. Lieberman made a number of valuable suggestions about lubrication and the use of heat-treated steel for axles.

John A. Garcia, of Allen & Garcia, Chicago, designers of the skip hoist, told the Institute some of the recent history of that method of hoisting coal and described some of the mining plants where skips are now used.

On the return trip of the boat from LaSalle to St. Louis, L. E. Young, president of the Union Colliery Co., recounted for the Institute some of the experiences his men had driving an entry through a fault in the Kathleen mine at Dowell, Ill.

Name Advisory Boards of Shippers for Full Co-operation with Railroads

The Car Service Division of the American Railway Association announces the appointment of regional advisory boards, composed entirely of shippers, and selected by the shipping public itself, for the purpose of bringing about the fullest measure of co-operation between the shippers and the railroads of the country. These boards will work in conjunction with the district manager of the Car Service Division, together with representatives of the railroads in the various districts.

Regional advisory boards have already been organized in five districts. In the Southeastern region, S. L. Yerkes represents the coal shippers on the advisory board. The Southwestern regional advisory board has A. P. Rudowsky, traffic manager of the Oklahoma operators, as a member, the Trans-Missouri-Kansas advisory board has C. E. Warner, of Kansas City, the Central Western has A. B. Currie, of Omaha, and the Northwestern region has Wayne Ellis, Ivan Bowen, Frank Milhollan and J. J. Murphy, representing the coal industry.

United Mine Workers Would Raise Wages and Cut Prices By Nationalization of Anthracite Mines

Reduction of charges against anthracite through a nationalization plan for the retirement of all capital stock of anthracite companies by the substitution of 6 per cent bonds and the retirement of these bonds through a period of fifty years is suggested in a brief filed with the U. S. Coal Commission by the anthracite miners. The brief, which was made public June 11, was prepared under the direction of Thomas Kennedy, Hazleton, Pa.; C. J. Golden, Shamokin, Pa.; and W. J. Brennan, Scranton, Pa., presidents of the three anthracite districts of the United Mine Workers of America, and is signed by Ellis Searles and John Moore.

In their brief the miners challenge the U. S. Coal Commission's procedure, declaring that neither the miners nor the public will know the facts about the industry unless the present accounting system is revised. The mine workers' officials assert that the commission's questionnaire to the coal operators gives no guarantee of securing the desired facts, and they are of the opinion that the figures obtained by it will probably be inaccurate. The brief recommends the installation of a uniform accounting system for the anthracite industry, so that the public may at all times be in position to ascertain the facts about its fuel supply, the costs, profits and everything connected with it.

"The financing of the anthracite industry," the brief states, "should be so regulated that within fifty years the industry can be entirely free from the charges made upon it by present investors. This applies to both mining companies and coal land companies. It is proposed that this be done without the slightest impairment of reasonable investment totals by:

"(1) Completing the retirement of the present bonded indebtedness.

"(2) Replacing the actual investment represented in outstanding stock by bonds bearing interest at 6 per cent, equal to the net sacrifice of such investment, and then retiring such bonds over a fifty-year period. Power to take stock for conversion purposes, by eminent domain, shall vest in the regulating authority.

"(3) Arranging for public or joint ownership and control of the properties as the stock is replaced by bonds.

"Necessary new capital for additions and betterments shrould come so far as possible from reinvested profits. With interest instead of dividends to pay, profits may be expected to produce a sum sufficient for such additions and betterments.

"We believe that no harm can result from planning out the financing of the industry fifty years ahead. If such planning had been done in 1873 there might be none of the recurrent dissatisfaction which has prevailed ever since. We have, in suggesting a fair return to investors, stated our conviction that the industry should pay no more than it has to pay for necessary new investment. In making our two proposals for financing the industry we have the above consideration in mind.

"We know also that the service which the investors of capital render to the industry is not a permanent one. There is at a given time a need for capital and it is secured by the issue of stocks or bonds. After a course of years, if sufficient surplus has been accumulated, there may be no further need for that capital. But the stocks and bonds are still outstanding and must legally receive their return annually, in the case of stock, indefinitely. The advantage of canceling these obligations has already been recognized by the stockholders of certain mining companies. They have frequently canceled their bonded indebtedness and preferred stock long before maturity.

"Retiring of securities is therefore made when the controlling elements in the companies have been able to accomplish it. It is the wise thing to do from their point of view. It makes their control more complete and more profitable. Just as these controlling elements in some of the companies recognize the fact that the services of certain investors are temporary, to be rewarded with the guarantee of an income for a definite time only, followed by a return of principal, so we recognize that fact. Managers and miners are both paid for their services until they are not needed in the business any more. Then they are discharged. We propose to follow these companies in their quiet accurate logic, and suggest that the industry treat the services of investors like the services of managers and miners."

The miners estimate that retiring the present investment would average only 28c. a ton over the next fifty years, while the amounts paid to capital holders were 78c. in 1920, and $1.40 in 1922-23, and may be more in the future.

The actual cost of the investment in the anthracite industry must be found, the miners say, and they also desire to ascertain the net sacrifice cost of investment. The latter they would base on what the investors have put into the business in cash or its equivalent, what they have taken out of the business in dividends or drawings, and what constitutes a fair and reasonable rate of return. They inform the commission that "if such investment figures are not secured, we fail to see how any fundamental program for the industry can be outlined, or any real progress made in the settlement of an intolerable situation."

The miners say that their proposals provide for a reduction in futurer liabilities of the industry, lower prices and better wages, and the elimination of "the disorganizing influence of high royalties." The brief continues:

"It is proposed that after the investors' net total sacrifice to date has been established and compared with the actual cost of investment, and after a uniform accounting system has been put into effect, a fair rate of return be allowed mining companies and coal land companies if and when earned. Six per cent would be considered as a fair rate of return. Earnings in excess of this rate should be devoted to additions and betterments, lower prices and better wages, as conditions warrant.

"Necessary new capital can be raised by authorized increases in the bonded indebtedness. In the case of coal land companies, excess returns would go to decrease future royalty rates. It is proposed that the investment of stockholders as determined be guaranteed by adequate depletion and depreciation reserves, so that the net sacrifice will be on hand to be returned in full as the several mines are exhausted.

"It will be noted that our proposals cover coal land companies as well as mining companies. This is a very essential provision. Many independent mining companies, because they pay high royalties, and because of their small size, feel free to charge, in time of shortage, as much as $5.50 a ton more than the large companies and to make such charges regardless of the actual mining cost. The result is that the same size and quality coal reaches the big cities at prices which have, in time of shortage, a $5.50 range. Consequently, as Colonel Goethals said in retiring from office as New York State Fuel Administrator, there is at present no way of checking the profiteering of wholesalers and retailers.

"The latter are put in a position where they can make the highest price they pay for any one shipment the basis of their charges to consumers, instead of taking a weighted average as the basis. We propose to eliminate a large part of the present mine cost of the smaller companies by guaranteeing that land owners get a fair return on their investment and no more. The result would be to decrease royalty charges drastically and to abolish the whole system by which prices to consumers can be raised beyond reasonable levels through the disturbing element of the small marginal producer."

In proof of the need for regulating the rate of return on investments in anthracite mining and land leasing the brief cites an instance of 30,000 acres of anthracite land bought by Stephen Girard in 1830 for $178,000, or $6 an acre, the

estimated royalty income of which up-to-date has been about $8,900,000 or 3,800 per cent net.

Citing the profits of five large companies in 1920 as running from 14 to 121 per cent, the brief says: "These figures represent the rate of net income to capital stock outstanding. It will be remembered that profits as reported are probably understated, due to bad accounting procedure."

The miners object especially to arbitrary revaluations of property as unjustifiable overcharges on the public. They ask that excess coal land reserves be eliminated from present mine costs, and quote the bituminous industry, where such elimination would reduce investment 53 per cent.

Wages, the brief states, are bound up with questions of financing the industry and it alleges that capital charges, depletion, interest and profits were 78c. per ton in 1918, and are estimated at $1.40 in 1923. In the opinion of the miners, "some limitation of the investors' constantly encroaching claims upon the industry is imperative."

Continuing, the brief says: "In respect to securing new capital, the fact that to 1920 four companies, mining together about 40 per cent of the total commercial production, had accumulated a book surplus of $74,000,000, leads to the belief that such new capital may be secured in adequate amounts from reinvested profits. Any surplus earnings over such needs would be devoted to reducing prices, paying better wages or hastening the amortization of bonds.

"Mining companies to a very considerable extent have built up the industry through corporate savings. This process should continue. It should become the accepted method for securing new funds. Their surplus earnings should, however, from now on become recognized public property. Only so can they be utilized in a manner which will help and not harm the future of the industry.

"Finally, we suggest that the control of the industry after capital has been retired or funded might rest with the management, the public, the miners or a combination of the three. Such control would be introduced concurrently with the conversion of capital stock into bonds. It is probable that such control would have to be exercised by a holding company under Government auspices. The exact method of ownership and control awaits definition. As we said before, we desire at this point to lay down the general principle of retiring the ever-encroaching claims of anthracite investors upon the public interest and to point out that such claims can be retired at a fraction of their present annual burden. We can see no reason why this should not be done."

Complete Unionization Would Skyrocket Prices, Says Bituminous Commission

Complete unionization of the bituminous coal-mining industry would operate to cause the price of coal to soar to unprecedented heights, according to a statement issued June 9 by the Bituminous Operators' Special Committee.

"If all of the American mines were unionized," the statement says, "the mere threat of such a strike as was called and maintained for five months last year would cause a buyers' panic which would send prices skyward. Under the conditions which existed last year, the beginning of the strike, while it caused some concern on the part of buyers, did not have an immediate effect on coal prices.

The non-union mines were put to work at capacity, bringing their output up so that they were able to supply half the tonnage ordinarily consumed by the country. In states where unionization is complete, such as, for instance, Indiana, the mining of coal was absolutely stopped by the strike. If the whole industry was dominated by the United Mine Workers of America, a general strike would prevent the mining of a single ton of coal anywhere in the United States.

"It is unreasonable to believe that the union would not wield this terrific weapon against the public to force upward the already inflated wage scale. This would increase the cost of producing coal, and would be reflected in higher prices."

Strike at Illinois Mine to Force Making of Scale for Underground Loaders

What scale will Illinois operators be forced to pay men who run mechanical loaders? The question has been coming rapidly to the fore recently as the number of loaders in the state increased and was brought to a head June 5 by a strike of about 300 men at the new Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co. near West Frankfort, Ill. The company has been paying a little above the union day wage to the operators of several loaders doing development work mainly. But the mine has reached a point now which gives the men excuse to assert that it is passing out of the development stage and therefore a loader scale should be fixed at once for room work and all other loader operations.

It is obvious that the miners have chosen the Orient No. 2 mine for the start of the loader scale controversy just now because they feel that the time and the place are propitious for forcing the new scale at the highest level. The company has been paying approximately $8.25 a day to loader operators, which is 75c. a day above the union day-wage scale. The machines are said to have operated successfully in spite of obstacles thrown in their way and the output of the mine has swelled. The miners assert that they have loaded out enough coal a day to average them $20 a day at the union tonnage rate. They demand that a scale be fixed at once. Negotiations have produced no scale. Hence the strike, which was not officially authorized by district union officers but was started by the men after a joint board of miners and operators had decided that the company was right, that a scale of $8.56 per day was fair and that the mine was still in the development stage.

A few loaders have been used in other big Illinois mines, but they also have been restricted almost entirely to entry work and rock loading. In Indiana another handful of loaders of various types have been used with varied success. The operators have been paid as high as $12 a day. The machine idea has been spreading with some speed in spite of the knowledge in every operator's mined that a scale for loading could not be fixed peacefully. The entire Middle West is watching with interest the controversy now going on at Orient No. 2.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of May*

(In Net Tons)

Ports	Railroads	1923 Cargo	1923 Fuel	1923 Total	1922 Cargo	1922 Fuel	1922 Total	1921 Cargo	1921 Fuel	1921 Total
Toledo	Hocking Valley	760,562	21,622	782,184	617,287	16,103	633,390	821,739	20,518	842,257
	N. Y. C.–Ohio Central Lines	304,405	9,456	313,861	.....	.....	.....	196,039	5,342	201,381
	Baltimore & Ohio	305,272	9,561	314,833	823,958	17,125	841,083	402,239	10,629	412,868
Sandusky	Pennsylvania	387,362	10,244	397,606	488,143	11,655	499,798	223,214	6,060	229,274
Huron	Wheeling & Lake Erie	272,491	9,261	281,752	7,612	334	7,946	424,250	11,132	435,382
Lorain	Baltimore & Ohio	474,584	30,316	504,900	17,820	3,353	21,173	625,935	24,727	650,662
Cleveland	Pennsylvania	323,427	22,443	345,870	43,358	6,704	50,062	512,323	20,143	532,466
	Erie	266,874	10,458	277,332	.....	.....	.....	126,769	4,260	131,029
Fairport	Baltimore & Ohio	92,771	8,503	101,274	.....	.....	.....	.....	.....	.....
Ashtabula	New York Central	844,358	40,764	885,122	31,083	5,757	36,840	462,355	16,887	479,242
	Pennsylvania	277,094	11,102	288,196	28,342	2,113	30,455	532,897	17,128	550,025
Conneaut	Bessemer & Lake Erie	524,636	26,974	551,610	24,744	194	24,938	196,091	1,911	198,002
Erie	Pennsylvania	101,209	11,801	113,010	23,575	6,685	30,260	278,816	12,901	291,717
Total		4,935,045	222,505	5,157,550	2,105,922	70,023	2,175,945	4,802,667	151,638	4,954,305

* Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.

Dock Operators Deny Illegal Practices

The response of the Northwestern Coal Dock Operators' Association to the charges of the Federal Trade Commission is a general denial of all allegations implying illegal action. As to the alleged existence of a conspiracy in restraint of trade and an effort to establish a monopoly, both charges are flatly denied. The operators admit that credit information is collected and distributed among the members of the association, but it is contended that this is a lawful practice. They deny that price lists have been circulated among members before publication or that there is one wholesale price for the independent retail companies in the Twin Cities and another for the retail concerns owned by the wholesalers. They offer to show the books of members and to supply any information bearing upon the question. They admit that they have sold the same grades of coal at differenet prices in the Twin Cities than at Duluth, which they explained on the basis of competition from rail coal in the Twin Cities that does not exist at Duluth.

Wholesalers Plan to Smooth Relations of Producers, Shippers, Buyers and Roads

An arbitration plan and other schemes for smoothing out relations between shippers and railroads and between producers, shippers and buyers of coal was awaiting decision of the American Wholesale Coal Association as it opened its convention in Cincinnati, Ohio, on Tuesday, June 12. It was hoped that the association would adopt a standard arbitration method and ask the railroads to adopt it also. An effort was to be made to get the railroads to stop permissive embargoes. Indications were that C. L. Dering, of Chicago, would be elected president to succeed Seth Morton, of Albany, N. Y., though the Pittsburgh delegation was grooming Vice-President Jay W. Johns for a race and the Cleveland contingent also showed signs of a counter administration attitude. About 150 men attended, all having something to say about the U. S. Coal Commission's requests upon wholesalers but nobody apparently proposing that anything be done about it.

John J. Tierney Dies in Philadelphia

John J. Tierney, vice-president and general sales manager of the Crozer-Pocahontas Coal Co. died in Philadelphia, June 11. The funeral is to be held at 10 a.m., June 14, at St. Patrick's Church, Philadelphia. Interment is to be at Newtown, Pa.

At the time of his death Mr. Tierney was the treasurer and a director of the National Coal Association, having served as the association's treasurer since 1917. He was a past president of the Smokeless Coal Operators' Association and had been active in the affairs of the Pocahontas Coal Operators' Association.

Mr. Tierney was born in Newcastle, Pa., Aug. 29, 1857. He married Miss Ida Reedy, of Tremont, Pa., in 1885. He first worked as a telegraph operator in the anthracite region and later attended Villanova College, Villanova, Pa. He was graduated as a mining engineer and worked on the engineering staff of the Philadelphia & Reading Coal & Iron Co. in the anthracite fields.

Mr. Tierney went to the Pocahontas field of West Virginia in 1885 as engineer for the Bluestone Land Co. and later became associated with the extensive Crozer interests there. Along with his own extensive interests throughout that section he was president of the Smokeless Coal Operators' Association of West Virginia from November, 1911, until December, 1915. He moved to Philadelphia and opened his present offices in November, 1900. He was an extensive reader and an authority on coal mining and coal sales.

At the time of his death Mr. Tierney had the following positions: President, Powhatan Coal & Coke Co., Powhatan, W. Va.; Sharon Coal & Coke Co., Sharondale, Ky.; Tierney Coal Co., Powhatan, W. Va.; vice-president, Crozer-Pocahontas Co. and Page Coal & Coke Co., Philadelphia, also Tierney Mining Co., Powhatan, W. Va. He also was a driector and stockholder in the Peerless Coal & Coke Co., Pottsville Pa., besides having numerous other large interests, mostly in mining properties.

Mr. Tierney is survived by his wife and four children: John L. Tierney, Sharondale, Ky.; Edward M. Tierney, Powhatan, W. Va., and Washington, D. C.; George E. Tierney, Philadelphia, and Mrs. Alexander Chambers, Newtown, Pa.

Supreme Court Says Industrial Tribunal Cannot Regulate Wages and Prices

The Kansas Court of Industrial Relations received what is practically equivalent to its death blow when, on June 11, the U. S. Supreme Court, in an unanimous opinion read by Chief Justice Taft, declared that the Industrial Court had no authority to fix wages of employees of the Charles Wolff Packing Co. While the Court did not directly declare the entire act creating the Industrial Court unconstitutional, the decision greatly limits the activities of the Kansas industrial tribunal and the effect probably will be to nullify the objects for which it was created.

The Kansas act gave the Industrial Court authority to adjust disputes and fix wages and conditions of labor in industries producing food, clothing, fuel and for public utilities. While an employee could not be prevented from quitting his job, concerted action, such as a strike, in the face of a mandate from the court was declared illegal.

In the case at issue the secretary of the Meat Cutters' Union in January, 1921, appealed to the court against a reduction in wages by the Charles Wolff Packing Co. A hearing was held and the Industrial Court ordered that wages be advanced beyond the scale fixed by the company, asserting that an emergency existed and that higher wages were in the public interest, as the plant produced food. The company resisted payment of the higher wages and the Industrial Court applied to the State Supreme Court for a mandamus to compel compliance with its order. A commissioner appointed by the State Supreme Court reported that the company had lost $100,000 the year previous and that the evidence did not support the claim that an emergency existed. The State Supreme Court overruled this report by the commissioner and issued the mandamus, whereupon the company applied to the U. S. Supreme Court for a write of error, alleging its property would be taken without due process of law.

In his decision, Chief Justice Taft says the act "curtails the right of the employer on the one hand and of the employee on the other to contract about his affairs. This is part of the liberty of the individual protected by the guarantee of the due process clause of the Fourteenth Amendment."

Coal Export Situation Shows Little Change

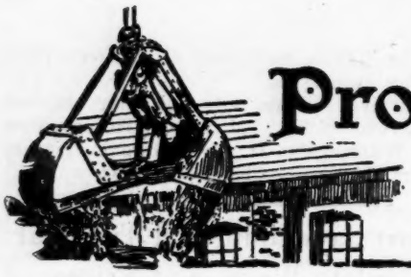
Reviewing the overseas coal export situation, F. R. Wadleigh, Federal Fuel Distributor, in a statement on June 8 announced that there has been no marked change since May 1, although coke exports have declined considerably and inquiries are few. An increase in the exports of coal to South America is noted.

Figures given by Mr. Wadleigh show an increase in overseas shipments of coal in April of 192,671 tons and of coke, 98,162 tons over the month of March, when the first effects of the French occupation of the Ruhr were felt.

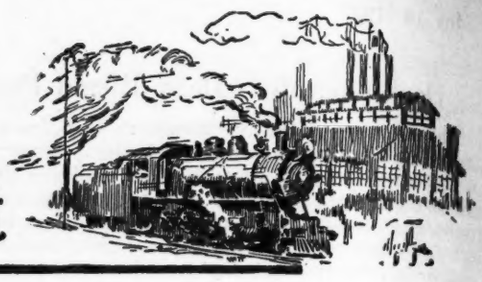
The statement shows that from April 30 to June 2 a total of 57 charters for coal and 9 for coke shipments abroad were closed.

The falling off in overseas shipments of coke is attributed mainly to an increase in shipments from the Ruhr district and to the expectation of further increases and a possible settlement of the Ruhr situation.

Accurate information on the Ruhr occupation as regards coal and coke production and shipments is impossible to obtain, Mr. Wadleigh states. The strikes in the Ruhr field are reported to be over, but the situation is still difficult and no settlement seems to be definitely in sight. It has been reported that production in April was about 45 per cent of normal and that shipments of coal to France and Italy have increased, but tonnage figures conflict.



Production and the Market



Weekly Review

Production and demand for bituminous coal are now so evenly matched that the market is for the time being becoming firmer. Prices in the aggregate, as shown by *Coal Age* Index of spot prices, held even last week, the average price of $2.60 and index of 215 being unchanged from the previous week. The strength is in the East, offsetting general dullness in the West and South.

The low point in spot prices with union wages at the present level was reached in March, 1922, at an average for the fourteen major coals of $2.05 per net ton at the mines, 55c. below the present level. Of the four Illinois coals on the list, Southern is yet 60c. above the pre-strike figure, Mt. Olive is 20c. below, and the others about equal. Indiana, western Kentucky, Hocking and Ohio No. 8 are now at approximately the same low point touched early in 1922.

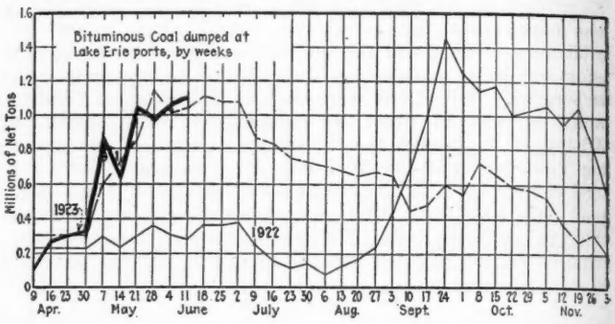
Eastern Kentucky is now higher by 90c., Clearfield by 65c., Pittsburgh by 25c., Cambria and Somerset by 85c., Kanawha by 60c. and Smokeless by 30c. than in March, 1922. Of course Smokeless, Somerset, parts of Clearfield and eastern Kentucky, although non-union, have a wage scale as high as or higher than the union scale, and materially above that in force when the low prices of March, 1922, were the rule. Of the ruling spot quotations there are but two that can be considered profitable—Smokeless and eastern Kentucky. Some shrinkage is possible in Cambria, Somerset and Clearfield prices, but the remainder of the list are at the bottom. With industrial and railroad buying on the present basis there is little likelihood of important spot price recessions through June and possibly July.

Production Well Maintained

Production of soft coal is well maintained at between 10,000,000 and 11,000,000 tons per week. Car supply is better in most fields despite the unprecedented records being attained in total freight loadings. In fact the excellent performance of the railroads leads many coal men to foresee ample cars next autumn and winter, and of course a very easy market. Output of bituminous coal in May was 41,555,000 tons, compared with 50,927,000 the corresponding month of 1918—the record year—47,086,452 in May, 1917, and 33,330,000 in 1921. Production this year to date has been 231,110,000 tons, exceeded in the same period only in 1918.

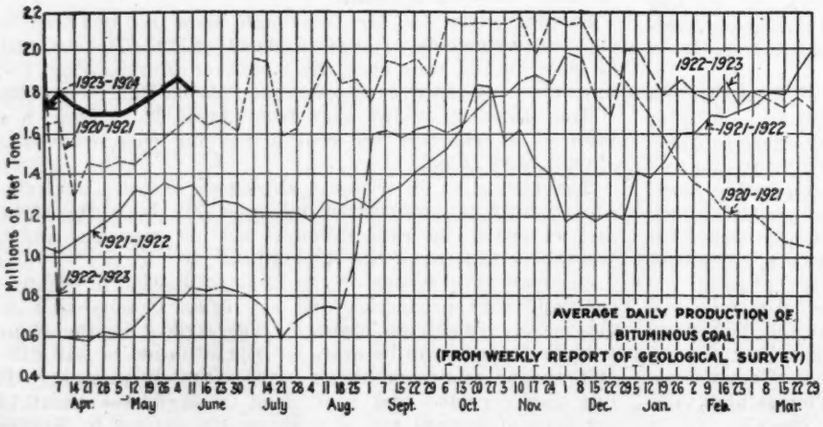
Buying for the Lake trade, for railroad fuel stocking and for New England industries are the chief features of the market. The overseas export demand is fading, a few scattering inquiries from South America being the only activity.

"Preliminary estimates of soft coal produced in the week ended June 2," says the Geological Survey, "placed the total, including coal coked, lignite, and mine fuel, at



10,059,000 net tons. Thus the short week shows a decrease of 990,000 tons from the revised estimate for the week preceding. The record of daily car loadings shows that with respect to soft coal production Memorial Day counted for one-third of a day. On that basis, the average daily loadings for the week show a small increase over the average of the full week preceding.

"Early returns on car loadings during the week June 4-9 indicate a slight decrease in the rate of production to somewhat below the level attained in the fourth week of May. The total output for the week probably will be in the neighborhood of 10,700,000 net tons."



Estimates of Production

(Net Tons)

BITUMINOUS

	1922	1923
May 19	4,481,000	10,270,000
May 26 (*b*)	4,889,000	11,049,000
June 2 (*a*)	4,616,000	10,059,000
Daily average	769,000	1,898,000
Calendar year	167,112,000	231,110,000
Daily average cal. year	1,280,000	1,777,000

ANTHRACITE

May 19	8,000	2,045,000
May 26	10,000	1,956,000
June 2	8,000	1,606,000
Calendar year	21,842,000	43,125,000

COKE

May 26 (*b*)	97,000	415,000
June 2 (*a*)	97,000	379,000
Calendar year	2,787,000	8,429,000

(*a*) Subject to revision. (*b*) Revised from last report.

Anthracite production is expected to fall off materially the last half of June due to union elections and the tri-district convention at Scranton on June 26. Prices hold firm, the premium on independent coal being unusual for this time of year. Domestic sizes are moving through dealers' yards to householders' cellars. The upper Lake region is already worrying about the smallness of hard-coal receipts. Anthracite loaded at Buffalo last week for Lake movement was 84,700 tons, of which 34,300 went to Duluth and Superior.

No Life in Chicago Market

The coal market in Chicago and the Midwest continued to bump bottom last week with no sign of material change one way or the other. Domestic demand is flat except in the Northwest, where coal is sold all the time from Indiana, Illinois and western Kentucky mines. The steam trade eased along with what it could pick up on the open market at rock-bottom prices.

Smokeless coals in Chicago glutted the market for a few days and bumped the price, but are expected to regain their position as soon as a burst of comparatively heavy shipping is over. A small, steady trade in anthracite is going on all the time. But other domestic trade south of the Minnesota line is dead and almost everything else in the coal trade is in the same condition. Contract coal is about all that is moving. No real strengthening of the market is expected before July 1.

St. Louis Is Inactive Too

A slim domestic trade in storage coal does not satisfy the coal selling agencies of St. Louis.

The southern Illinois mines are stumbling along with one and one half and two days a week working time, while their tracks stand full of no-bills. Du Quoin and Jackson County mines are even worse, as might be expected. A little railroad coal is about all that moves. The Mt. Olive mines continue to approach a complete standstill. Standard district operators freely admit that if it were not for railroad storage business they would be shut down.

After getting about as low as it is possible to go with the present labor scale in western Kentucky, prices have taken a check, and a firmer market is reported. Prepared sizes are quite firm all through the list. Mine-run prices are a little low due to competition from some of the small mines and wagon mines.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

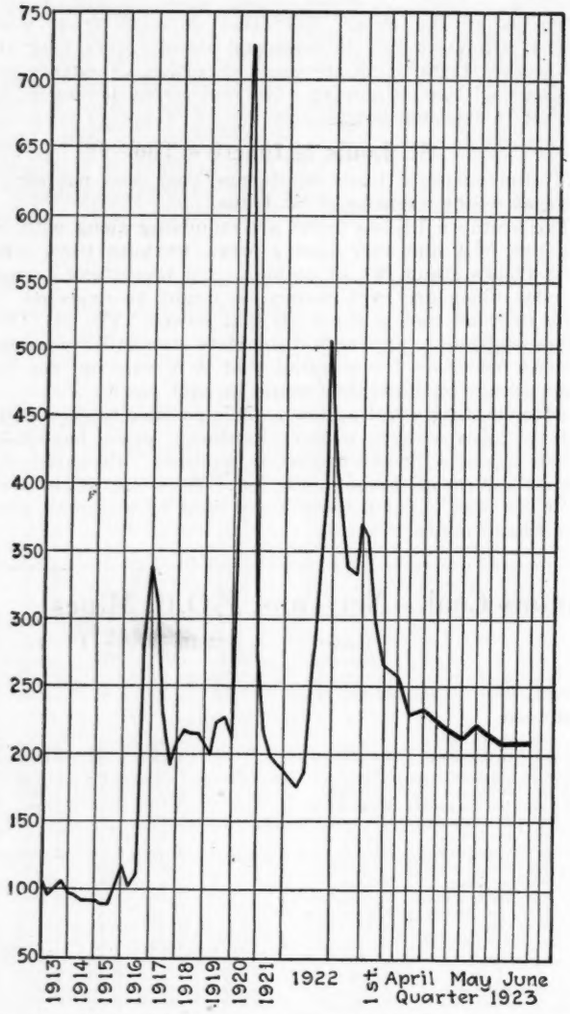
	Market Quoted	June 12 1922	May 28 1922	June 4 1923	June 11 1923†
Low-Volatile, Eastern					
Smokeless lump	Columbus	$3.75	$6.25	$6.25	$6.00@$6.50
Smokeless mine run	Columbus	3.50	4.15	4.25	4.00@ 4.50
Smokeless screenings	Columbus	3.20	3.60	3.60	**3.35@ 3.90**
Smokeless lump	Chicago	3.65	6.10	6.10	6.00@ 6.25
Smokeless mine run	Chicago	3.40	4.10	4.10	4.00@ 4.25
Smokeless lump	Cincinnati	3.65	6.25	6.25	6.00@ 6.50
Smokeless mine run	Cincinnati	3.40	4.25	4.10	4.00@ 4.25
Smokeless screenings	Cincinnati	3.00	4.25	4.00	4.00
*Smokeless mine run	Boston	6.65	6.35	6.35	*6.00@ 6.25*
Clearfield mine run	Boston	3.25	2.35	2.35	**2.25@ 3.00**
Cambria mine run	Boston	3.75	3.05	3.10	2.75@ 3.50
Somerset mine run	Boston	3.25	2.60	2.85	2.50@ 3.25
Pool 1 (Navy Standard)	New York	.....	3.75	3.75	3.50@ 4.00
Pool 1 (Navy Standard)	Philadelphia	.....	3.75	3.75	3.40@ 4.00
Pool 1 (Navy Standard)	Baltimore	.....	.....	.....	.....
Pool 9 (Super. Low Vol.)	New York	4.00	2.90	2.85	*2.60@ 3.00*
Pool 9 (Super. Low Vol.)	Philadelphia	4.05	2.85	2.85	*2.50@ 3.10*
Pool 9 (Super. Low Vol.)	Baltimore	4.25	2.55	2.55	**2.75@ 2.80**
Pool 10 (H.Gr.Low Vol.)	New York	4.00	2.45	2.35	**2.25@ 1.75**
Pool 10 (H.Gr.Low Vol.)	Philadelphia	3.75	2.35	2.30	*2.10@ 2.45*
Pool 10 (H.Gr.Low Vol.)	Baltimore	3.75	2.15	2.15	**2.25**
Pool 11 (Low Vol.)	New York	4.00	2.05	2.00	1.75@ 2.25
Pool 11 (Low Vol.)	Philadelphia	3.50	2.00	1.95	*1.70@ 2.15*
Pool 11 (Low Vol.)	Baltimore	3.75	1.95	1.95	**2.00**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	4.00	2.00	1.85	1.75@ 2.00
Pool 54-64 (Gas and St.)	Philadelphia	.....	2.05	2.05	**2.00@ 2.20**
Pool 54-64 (Gas and St.)	Baltimore	3.80	1.75	1.75	**1.90**
Pittsburgh sc'd gas	Pittsburgh	.....	2.85	2.85	2.75@ 3.00
Pittsburgh mine run (St.)	Pittsburgh	.....	2.25	2.20	2.15@ 2.25
Pittsburgh slack (Gas)	Pittsburgh	.....	1.65	1.55	*1.50@ 1.60*
Kanawha lump	Columbus	3.65	2.75	2.75	**2.50@ 3.10**
Kanawha mine run	Columbus	3.40	2.05	2.05	1.90@ 2.20
Kanawha screenings	Columbus	3.15	1.75	1.60	**1.50@ 1.80**
W. Va. lump	Cincinnati	3.50	4.00	3.10	**2.50@ 4.00**
W. Va. Gas mine run	Cincinnati	3.50	1.85	1.70	**1.60@ 2.00**
W. Va. Steam mine run	Cincinnati	3.25	1.85	1.70	**1.60@ 2.00**
W. Va. screenings	Cincinnati	3.15	1.50	1.40	*1.25@ 1.50*
Hocking lump	Columbus	3.65	2.55	2.60	2.35@ 2.90
Hocking mine run	Columbus	3.40	1.90	1.85	1.75@ 2.00
Hocking screenings	Columbus	3.15	1.35	1.35	1.25@ 1.50
Pitts. No. 8 lump	Cleveland	4.00	2.95	2.85	*2.35@ 3.25*
Pitts. No. 8 mine run	Cleveland	$3.70	$2.15	$2.05	$2.00@$2.10
Pitts. No. 8 screenings	Cleveland	3.70	1.50	1.45	*1.35@ 1.45*
Midwest					
Franklin, Ill lump	Chicago	.....	3.80	4.05	3.75@ 4.35
Franklin, Ill. mine run	Chicago	.....	3.10	3.10	3.00@ 3.25
Franklin, Ill. screenings	Chicago	.....	1.80	1.80	*1.75@ 1.85*
Central, Ill. lump	Chicago	.....	2.60	2.60	2.50@ 2.75
Central, Ill. mine run	Chicago	.....	2.10	2.10	2.00@ 2.25
Central, Ill. screenings	Chicago	.....	1.85	1.85	*1.50@ 1.75*
Ind. 4th Vein lump	Chicago	.....	3.35	3.35	3.25@ 3.50
Ind. 4th Vein mine run	Chicago	.....	2.85	2.60	2.50@ 2.75
Ind. 4th Vein screenings	Chicago	.....	1.85	1.80	1.75@ 1.85
Ind. 5th Vein lump	Chicago	.....	2.85	2.85	2.75@ 3.00
Ind. 5th Vein mine run	Chicago	.....	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	.....	1.55	1.55	1.50@ 1.65
Standard lump	St. Louis	.....	2.25	2.35	2.25@ 2.50
Standard mine run	St. Louis	.....	1.80	1.80	1.75@ 1.90
Standard screenings	St. Louis	.....	1.50	1.50	1.50
West Ky. lump	Louisville	3.75	2.30	2.30	2.25@ 2.35
West Ky. mine run	Louisville	3.75	1.80	1.80	*1.65@ 1.85*
West Ky. screenings	Louisville	3.75	1.35	1.35	1.25@ 1.50
West Ky. lump	Chicago	4.15	2.35	2.35	2.25@ 2.50
West Ky. mine run	Chicago	3.95	1.35	1.45	1.40@ 1.50
South and Southwest					
Big Seam lump	Birmingham	2.20	2.70	3.05	2.90@ 3.20
Big Seam mine run	Birmingham	1.85	2.05	2.05	1.85@ 2.25
Big Seam (washed)	Birmingham	1.85	2.35	2.35	2.25@ 2.50
S. E. Ky. lump	Chicago	3.75	3.75	3.25	3.00@ 3.50
S. E. Ky. mine run	Chicago	3.50	2.35	2.35	2.25@ 2.50
S. E. Ky. lump	Louisville	3.75	3.75	3.50	3.25@ 3.75
S. E. Ky. mine run	Louisville	3.50	2.25	2.25	2.00@ 2.50
S. E. Ky. screenings	Louisville	3.25	1.65	1.65	1.50@ 1.85
S. E. Ky. lump	Cincinnati	3.50	3.75	3.05	**2.50@ 3.75**
S. E. Ky. mine run	Cincinnati	3.40	1.80	1.60	**1.50@ 1.85**
S. E. Ky. screenings	Cincinnati	3.15	1.55	1.55	*1.25@ 1.75*
Kansas lump	Kansas City	5.00	3.85	3.85	**3.50@ 4.50**
Kansas mine run	Kansas City	4.25	3.25	3.25	3.00@ 3.50
Kansas screenings	Kansas City	2.85	2.60	2.60	2.50@ 2.75

* Gross tons, f.o.b. vessel, Hampton Roads.
† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Latest Independent	Pre-Strike Company	June 4, 1923 Independent	June 4, 1923 Company	June 11, 1923† Independent	June 11, 1923† Company
Broken	New York	$2.34	.....	$7.60@$7.75	.....	$7.75@$8.35	.....	$7.75@$8.35
Broken	Philadelphia	2.39	$7.00@$7.50	7.75@ 7.85	.....	7.00@ 8.10	.....	7.00@ 8.10
Egg	New York	2.34	7.60@ 7.75	7.60@ 7.85	$8.50@11.25	8.00@ 8.35	**$8.50@$11.50**	8.00@ 8.35
Egg	Philadelphia	2.39	7.25@ 7.75	7.75	9.25@ 9.50	8.10@ 8.35	**9.25@10.00**	8.10@ 8.35
Egg	Chicago*	5.09	7.50	8.25	8.50@11.50	8.00@ 8.50	8.50@11.50	8.00@ 8.50
Stove	New York	2.34	7.90@ 8.20	7.90@ 8.10	8.50@11.25	8.00@ 8.35	**8.50@11.50**	8.00@ 8.35
Stove	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.25	9.25@ 9.50	8.15@ 8.35	**9.25@10.00**	8.15@ 8.35
Stove	Chicago*	5.09	7.75	8.25	8.50@11.50	8.00@ 8.50	8.50@11.50	8.00@ 8.50
Chestnut	New York	2.34	7.90@ 8.20	7.90@ 8.20	8.50@11.00	8.00@ 8.35	8.50@11.00	8.00@ 8.35
Chestnut	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.15	9.25@ 9.50	8.15@ 8.35	**9.25@10.00**	8.15@ 8.35
Chestnut	Chicago*	5.09	7.75	8.25	8.50@11.50	8.00@ 8.50	8.50@11.50	8.00@ 8.50
Ranges	New York	2.34	.....	.....	.....	8.30	.....	8.30
Pea	New York	2.22	5.00@ 5.75	5.75@ 6.45	6.30@ 7.50	6.00@ 6.30	**7.00@ 8.00**	6.00@ 6.30
Pea	Philadelphia	2.14	5.50@ 6.00	6.10@ 6.25	7.00@ 7.25	6.15@ 6.20	7.00@ 7.25	6.15@ 6.20
Pea	Chicago*	4.79	6.00	6.25	7.00@ 8.00	6.00@ 6.50	7.00@ 8.00	6.00@ 6.50
Buckwheat No. 1	New York	2.22	2.75@ 3.00	3.50	2.50@ 3.25	3.50@ 4.15	**2.75@ 3.50**	3.50@ 4.15
Buckwheat No. 1	Philadelphia	2.14	2.75@ 3.25	3.50	2.75@ 3.50	3.50	2.75@ 3.50	3.50
Rice	New York	2.22	2.00@ 2.50	2.50	1.75@ 2.50	2.50	1.75@ 2.50	2.50
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	1.75@ 2.50	2.50	1.75@ 2.50	2.50
Barley	New York	2.22	1.50@ 1.85	1.50	1.00@ 1.50	1.50	**1.25@ 1.50**	1.50
Barley	Philadelphia	2.14	1.50@ 1.75	1.50	1.15@ 1.50	1.50	1.15@ 1.50	1.50
Birdseye	New York	2.22	.....	2.00@ 2.50	1.50@ 1.60	1.60	.....	1.60

*Net tons, f.o.b. mines †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 215, Week of June 11, 1923. Average spot price for same period, $2.60. This diagram shows the relative, not the actual prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

Car supply is good, especially on the Louisville & Nashville lines this month, while the Illinois Central is well up. Mines are reporting around a day and a half to two days a week.

Louisville Hears of Labor Troubles

According to reports of operators and jobbers shortage of cheap labor for unloading cars is resulting in retailers in Louisville and in many districts having shipments held up on orders and this is also having a tendency to check retail buying and industrial stocking. The talk of cutting miners' wages in non-union eastern Kentucky to reduce coal prices is worrying operators paying the union scale.

Movement of prepared coal is fairly good, considering the season. A fair movement to the Lakes is getting away from the Hazard field, and in the Harlan district bigger operators are getting into the Lake movement. Screenings are weakening as a result of increasing production of prepared sizes.

The coal market at Milwaukee is dull. Wholesale and retail movements are only fair for the season. While prices are seemingly maintained at the May schedule, jobbers of western coal assert that dock men are secretly cutting to the extent of 50c. to 75c. per ton on eastern soft coal in an endeavor to win back the trade lost during the recent fuel famine. They say this course is being pursued at the head of the Lakes, where coal is now $1 per ton cheaper than at Lake Michigan ports, and that a general campaign of price cutting may ensue at Milwaukee before long.

The recent 50-c. Kansas City advance in the price of Arkansas semi-anthracite, portending as it did, other advances to come, resulted in a few householders placing orders for their winter's supplies, but the increase was not sufficiently large to be reflected in the wholesale market. Industrial contracts are keeping the mines running one or two days a week, and there is a slight increase in the demand for threshing coal from the southern end of the wheat belt, but as a whole the market out here is as quiet as a mid-summer Sunday afternoon.

Utah Market Improves Slightly

There is a slight improvement in the Utah coal market due to a cold snap. Production is about 35 per cent of capacity but is expected to increase at an early date when storage coal is bought. Up to date very few storage orders have been received. Prices remain firm. Labor conditions are satisfactory, except that 25 per cent, or thereabouts, of the men have drifted into the metal mines as a result of short time in the coal fields and labor may be scarce when the market improves.

Colorado operators have not made any statements regarding the recent drop in intrastate freight rates, other than that it would mean lower prices in the near future. The prices on all bituminous products have been increased 25c. per ton, effective June 1. A similar change has been made in the lignite fields. Trade is at a standstill.

Embargoes Steady Cincinnati Market

At Cincinnati the market has been held steady by embargoes placed against shipments to lake ports by the L. & N. Railway, which claims that 20,000 cars are between Cincinnati and Toledo and Sandusky. Spot market prices are indefinite but contract and quality coals continue to command good prices. Steam trade at Columbus was quiet. Buying was limited to current wants, with no apparent intention of increasing reserves although it was said some buyers are accumulating reserve stocks. Domestic trade was quiet although some consumers are laying in Pocahontas and other fancy grades believing that prices may go higher. Production in the eastern Ohio field was within 35,000 tons during the week ended June 2, which included a holiday, of the previous week's output. Demand for lake coal subsided somewhat because of accumulations at the lower lake ports. Demand for steam coal from industries was quiet.

Quotations for 2-in. West Virginia lump at Cincinnati range from $2.50@$3 and for Southeastern Kentucky 2-in. lump $2.50@$2.75, as compared with last week's quotations of $2.75@$3 for West Virginia 2-in. lump and $2.60@$3 for southeastern Kentucky 2-in. lump.

Requirements in the Pittsburgh district increased, due chiefly to the demands of the lake trade, which has been reflected in output. There was no change in the spot market. Demand at Buffalo is slow and the outlook poor. Consumers are buying only to meet current needs.

Production in the central Pennsylvania fields during the week ended June 3 was 15,700 cars, as compared with 17,588 cars the previous week. The output for May was 73,768 cars. Operators are receiving inquiries concerning contracts but are not eager to sign up at present prices. It is estimated there are 300 operations in the district where mining is suspended and that many others are working only part time.

New England Market Sluggish

In New England the current market is sluggish. Buying relaxed and none of the industries seems more than mildly interested in accumulating reserves. In spite of reasonably active buying a month ago there was no special advance in prices all-rail, and possible purchasers are inclined to wait now until well into the summer. While sales agents are still urging probable transportation troubles there is less reaction now to the argument than was the case early in May. Neither all-rail nor coastwise is there likely to be more than scattering business during June, and there are

those who expect the present dullness to continue through July.

The week measured a further decline in quotations at Hampton Roads. Reports show increased tonnages at the piers, and $6 per ton f.o.b. vessel is reported the latest selling price of No. 1 Pocahontas and New River. Dumpings coastwise are by no means heavy, however, and apparently there is little chance of firmer quotations for the present. Car movement would improve were coal orders forthcoming, but both west and east the agencies are hard put to it to move current output.

For distribution inland from points like Boston and Providence there is little change. Practically no coal is being forced on the market, and the factors who have facilities of their own are able to maintain prices about on the $8@$8.25 level previously reported. Certain of the quality grades from central Pennsylvania have been sold up for the next thirty days or so, and this condition makes it less necessary for rehandlers of smokeless coals to modify prices. Medium-grade Clearfields have not met with any strong demand in this territory, and quotations on coals of that character are still on a minimum basis.

Shippers of Pennsylvania coals who withdrew from the market a fortnight ago are now back soliciting business for the second half of June. This, of course, creates an unfavorable impression upon buyers, and it is no wonder there now is a pronounced feeling that quotations will recede in the near future.

Quiet at New York and Philadelphia

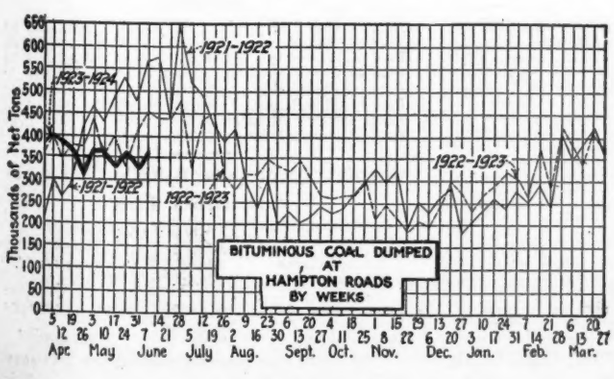
Demand in the New York market is quiet while inquiries are for the better grades. Receipts at the local docks are smaller, 1,731 cars being reported on June 8 with quotations for the better grades showing increases. The Philadelphia market shows no material change. Consumers are not expected into the market before July 1, when it is believed there will be a movement to stock more heavily around industrial plants.

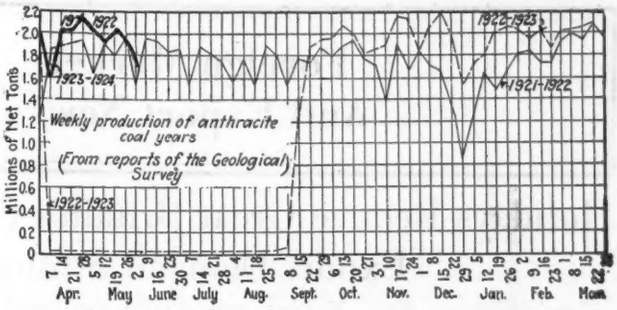
The market at Baltimore took an upward trend, due to the closing down of more mines supplying that market. There was a better demand for Pool 9 coals for export, whereas the overseas demand heretofore has been mostly for gas coals. Reports from West Virginia indicate that there is a strong demand for smokeless coals not only at tidewater but also from the west.

A dull and listless market was reported at Birmingham, Ala., with hardly any inquiry for spot steam coals and no disposition on the part of the railroads and contract interests to store fuel far in advance of current requirements. Production has decreased and the surplus coal is being gradually cleaned up.

Lake Shipments Disappoint

Lake shipments received at Duluth during May totaled 205,716 tons of anthracite and 1,636,628 tons of bituminous coal. Dock men are becoming nervous because of the small anthracite arrivals. Shipments from the docks at Duluth during May amounted to 7,964 cars, which was disappointing to shippers. During the week ended June 11 there was dumped at lake ports 1,072,416 net tons of cargo coal and 50,632 net tons of fuel coal, making the dumpings for the season 6,371,780 net tons of cargo coal and 288,098 net tons of fuel coal.




Millions of Net Tons
1921-1922
1922-1923
1923-1924
Weekly production of anthracite coal years
(From reports of the Geological Survey)
1922-1923
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.

Domestic Anthracite Moves Rapidly

Domestic sizes of anthracite continue to move rapidly. There is a heavy demand in all sections as well as in Canada and most independent producers as well as the larger companies are well booked ahead. So far retail dealers have not been able to start stocking, and most dealers claim to have sufficient orders on their books to keep them busy for the balance of the summer. The steam sizes are easier, some companies storing considerable tonnage of these sizes while some independents were disposing part of their output in connection with the larger coals.

The Geological Survey report says: "Production of anthracite in the week ended June 2 decreased 25 per cent from the hitherto current rate of about 2,000,000 net tons a week. The principal carriers of anthracite reported loading 30,700 cars, from which it is estimated that the total output including mine fuel, local sales, and the product of dredges and washeries, was 1,606,000 net tons. No loadings were reported on Memorial Day and on the three following days of the week loadings averaged 10 per cent less than for the same days of the previous week.

"Preliminary reports on car loadings during the first three days of the week June 4-9 show increased rate of production, which if continued through the balance of the week will bring production up to about 1,950,000 net tons."

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Jan. 1 to Apr. 1, 1922 Inclusive	Sept. 5 to Dec. 30, 1922 Inclusive	Jan. 1 to May 26, 1923 Inclusive	Week Ended May 26, 1923
U. S. Total	55.7	....	....	....
Somerset County	74.9	36.3	37.9	65.5
Panhandle, W. Va.	51.3	57.3	57.4	71.4
Westmoreland	58.8	65.8	58.1	70.9
Virginia	59.9	55.7	57.6	67.6
Harlan	54.8	22.1	21.5	31.2
Hazard	58.4	16.4	26.1	48.6
Pocahontas	60.0	36.6	39.7	54.8
Tug River	63.7	28.8	37.8	65.6
Logan	61.1	26.2	32.0	40.5
Cumberland-Piedmont	50.6	31.7	49.8	61.3
Winding Gulf	64.3	30.4	36.5	45.6
Kenova-Thacker	54.3	42.4	37.8	47.5
N. E. Kentucky	47.7	28.4	30.1	35.1
New River	37.9	31.6	37.8	46.6
Oklahoma	59.6	59.1	44.1	25.3
Iowa	78.4	75.9	70.9	56.1
Ohio, Eastern	46.6	40.8	39.2	64.2
Missouri	66.8	76.3	69.7	61.9
Illinois	54.5	49.9	43.0	32.6
Kansas	54.9	55.9	46.5	61.8
Indiana	53.8	37.7	46.9	35.0
Pittsburgh†	39.8	41.2	40.4	70.0
Central Pennsylvania	50.2	53.4	50.1	57.4
Fairmont	44.0	35.5	42.7	51.6
Western Kentucky	37.7	32.4	32.0	33.0
Pittsburgh*	31.9	56.1	64.3	87.2
Kanawha	13.0	15.6	23.5	27.3
Ohio, Southern	24.3	38.1	30.6	31.5

* Rail and river mines combined.
† Rail mines.

Car Loadings, Surplusages and Shortages

	Cars All Cars	Loaded Coal Cars
Week ended May 26, 1923	1,014,029	192,092
Previous week	991,797	181,599
Same week in 1922	806,877	90,730

	Surplus Cars All Cars	Surplus Cars Coal Cars	Car Shortage	
May 31, 1923	32,443	3,953	16,277	11,392
Same date in 1922	305,198	195,439	....	....
May 22, 1923	22,700	2,776	20,585	14,620

Foreign Market And Export News

Holidays Reduce Great Britain's Coal Output; Export Demand Strong

Two holidays, Whit Monday and Queen Victoria's birthday, tended to reduce Great Britain's coal output for the week ended May 26 to 3,737,000 tons, says a cable to *Coal Age*. Production for the previous week was 5,797,000 tons.

Demand for early shipment from South Wales is easier but there was good inquiry for deliveries during the last six months of the year, particularly from France, Italy, Egypt and South America.

Trade Commissioner Alexander V. Dye, at London, informed the Department of Commerce at Washington, that during the first three months of 1923 bunker coal furnished in the ports of the United Kingdom was 4,568,320 tons, as compared with 4,403,262 tons for the corresponding period of 1922, the slight increase being in marked contrast to the large increase in the coal exports from Great Britain during the same period.

The principal reasons attributed by Commissioner Dye for the failure to increase the amount of bunker coal furnished at United Kingdom ports were the increasing use of oil as fuel, congestion at the docks, resulting in a long delay in loading, and the rise in prices of British coal.

Hampton Roads Situation Dull

Business at Hampton Roads was dull last week, with the market weakening and inquiries falling off. Shippers looked forward to little increase in activity before July, or, perhaps, August.

Coastwise movement was desultory, while bunkers held fairly strong, with export business holding its own. No new contracts were being made. Shipments were largely on orders placed a month or two months ago.

Domestic dealers showed a reluctance to make contracts, preferring to take their chances on what appears to be a steadily declining market. A campaign to encourage domestic consumers to lay in their supplies of coal for next winter is being made, and is stimulating business, to some extent.

French Coal April Imports and Exports

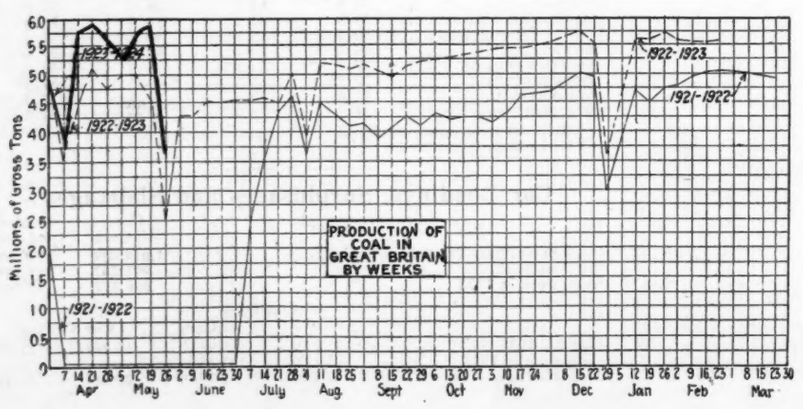
French coal imports and exports during April, according to French Customs returns, follow, in metric tons:

IMPORTS

Coal:	
Saar	877
Great Britain	1,526,742
Belgium	238,856
United States	18,780
Germany	63,307
Spain	2,500
Netherlands	72,377
Czecho-Slovakia	2,963
Various Countries	161
Total	1,926,563
Coke:	
Great Britain	65,499
Belgium	40,090
Germany	85,868
Netherlands	33,896
Czecho-Slovakia	2,402
Saar	5,204
United States	11,030
Total	243,989
Patent fuel:	
Great Britain	9,715
Belgium	27,377
Germany	4,731
Netherlands	2,736
Various countries	89
Total	44,648

EXPORTS

Coal:	
Belgium and Luxemburg	10,078
Switzerland	25,064
Spain	88
Italy	2,144
Germany	301
Saar	45,091
Bunkers { French steamers	9,570
Bunkers { Foreign steamers	3,658
Total	95,994
Coke:	
Switzerland	7,097
Belgium and Luxemburg	411
Spain	199
Italy	10,123
Various countries	3,477
Total	21,293
Patent fuel:	
Switzerland	19,614
Belgium	586
Algeria	3,932
Bunkers { French steamers	477
Bunkers { Foreign steamers	126
Various countries	2,677
Total	27,412



Swiss Coal Imports

Imports of bituminous coal by Switzerland during April last was 160,000 tons as compared with 137,000 tons during the previous month. There was also imported 32,000 tons of coke and 60,000 tons of briquets, as compared with 29,000 tons and 46,000 tons, respectively, during March. Of the coal imported England supplied 47,000 tons, Holland 35,000 tons, France 27,000 tons and Belgium, 24,000 tons.

Export Clearances, Week Ended June 9, 1923

FROM BALTIMORE

	Net Tons
For Algeria:	
Br. SS. St. Dunstan, for Algeria	7,594
For Argentine:	
Nor. SS. Landaas, for Argentine	6,399
For France:	
Br. SS. Pathan, for France	7,123
For Germany:	
Ger. SS. Eisenach, for Germany	3,809
Br. SS. Suveric, for Germany	10,789
For Italy:	
Nor. SS. Hallgrim, for Italy	10,307

FROM HAMPTON ROADS

For Algeria:	
Du. SS. Ary, for Algiers	6,609
Jugo Slav SS. Izvor, for Algiers	5,821
For Brazil:	
Br. SS. Hesione, for Rio de Janeiro	5,524
Br. SS. Pentwyn, for Pernambuco	5,594
For Canada:	
Dan. SS. Wien, for Gaspe	2,655
Nor. SS. Christian Krogh, for Gaspe	2,636
For Cuba:	
Nor. SS. Munorway, for Havana	3,518
For England:	
Swed. SS. Lygnern, for Land's End	7,448
For France:	
Du. SS. Parkhaven, for Bordeaux	6,842
Br. SS. Mongolian Price, for Marseilles	8,359
For West Indies:	
Nor. SS. Bur, for Fort de France	6,372
Nor. SS. Hundvaago, for Curacao	5,679

FROM PHILADELPHIA

For Cude:	
Nor. SS. Navarra, for Havana	
For Italy:	
Ital. SS. Piave, for West Coast Italy	

Hampton Roads Pier Situation

	May 31	June 7
N. & W. piers, Lamberts Pt.:		
Cars on hand	1,218	980
Tons on hand	74,173	59,228
Tons dumped for week	103,538	111,884
Tonnage waiting	13,875	10,400
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	974	1,578
Tons on hand	111,980	92,080
Tons dumped for week	111,375	134,235
Tonnage waiting	10,073	20,221
C. & O. piers, Newport News:		
Cars on hand	975	1,034
Tons on hand	55,235	57,920
Tons dumped for week	81,270	72,050
Tonnage waiting	23,110	2,550

Pier and Bunker Prices, Gross Tons

PIERS

	June 2	June 9†
Pool 9, New York	$5.25@$5.75	**$5.65@$6.00**
Pool 10, New York	4.50@ 5.25	**4.95@ 5.50**
Pool 11, New York	3.75@ 4.50	**4.00@ 4.75**
Pool 9, Philadelphia	5.80@ 6.15	*5.50@ 5.90*
Pool 10, Philadelphia	4.90@ 5.45	*4.60@ 5.30*
Pool 11, Philadelphia	3.90@ 4.50	*3.80@ 4.45*
P. 11, Hamp. Roads	6.50@ 6.75	*6.35@ 6.50*
Pools 5-6-7, Hamp. Rds.	4.85@ 5.00	*4.85*
Pool 2 Hamp. Roads	6.25@ 6.40	*6.10*

BUNKERS

Pool 9, New York	5.55@ 6.05	**5.95@ 6.30**
Pool 10, New York	4.80@ 5.55	**5.25@ 5.80**
Pool 11, New York	4.05@ 4.80	**4.30@ 5.05**
Pool 9, Philadelphia	6.05@ 6.25	*5.90@ 6.10*
Pool 10, Philadelhia	5.05@ 5.80	*4.90@ 5.60*
Pool 11, Philadelphia	4.20@ 4.90	*4.05@ 4.75*
Pool 1, Hamp. Roads	6.50@ 6.75	*6.35@ 6.50*
Pool 2, Hamp. Roads	6.25@ 6.40	*6.10*

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	June 2	June 9†
Admiralty, large	42s.6d.	*40s.@41s.6d.*
Steam smalls	32s.6d.	*31s.6d.*
Newcastle:		
Best steams	30s.@32s.	*27s.6d.@28s.6d*
Best gas	32s.@34s.	*32s.6d.*
Best bunkers	29s.@32s.	**30s.@32s.**

† Advances over previous week shown in **heavy type**, declines in *italics*.

News Items From Field and Trade

ALABAMA

Charges made in a recent complaint to the U. S. Coal Commission by J. R. Kennamer, president of District No. 20 of the United Mine Workers, that "gunmen" employed during a recent strike at Marvel, by the Roden Coal Co. had put oil in springs where miners and their families got water are denied in a letter made public June 8 by the Bituminous Operators' Special Committee. The letter, written by B. F. Roden, president of the coal company, states that "there are no springs at Marvel except small wet-weather springs of stagnant water, which are oiled to prevent malaria and contamination." His employees, Mr. Roden declares, are furnished free water. The company continued to furnish free water to strikers for three months, he added, but when the strikers refused to vacate the company houses so that other men could be put to work, it was no longer considered necessary to pump about 60,000 gallons of water daily to strikers whose avowed purpose was "to break the company."

ARKANSAS

The Southwestern Coal Commission was recently organized at Fort Smith, in compliance with the terms of a contract previously signed in Kansas City covering operation of coal mines in the Southwestern territory. The commission was organized at a joint meeting of coal operators and miners from District 21, United Mine Workers. John L. Britton, of McAlester, Okla., president of the district, was elected chairman of the commission. Other members are: Representing the miners, Dave F. Frampton, Moberly, Mo., organizer, and W. C. Dockerman, Huntington, Ark. For the operators, J. C. Reid, general manager Cameron Coal Co., Williams, Okla.; Robert Boyd, Central Coal & Coke Co., Hartford, Ark., and P. R. Stewart, Fort Smith, Ark., commissioner for the Coal Operators' Association.

CALIFORNIA

Los Angeles harbor is to have a new 30,000-ton daily capacity coal-bunkering wharf to be second to none on the Pacific Coast. Announcement of this, which will increase the number of ships entering the Los Angeles harbor at least 25 per cent and will mean the expenditure of millions of dollars, was made by Edgar H. McKee, president of the harbor commissioners. It will cost approximately $2,000,000.

COLORADO

McNally & Thompson have opened a new mine, the Sunshine, at Maitland, Huerfano County, with Denver & Rio Grande R.R. connections. This company also operates the Maitland mine at the same location.

ILLINOIS

Stout opposition is still raised by the City of Cairo and other southern Illinois communities to the building of the Illinois Central's proposed 172-mile cut-off from Edgwood to Fulton, Ky., shortening the main line 21 miles and eliminating many heavy grades. The railroad now pays the state a freight tonnage tax under a franchise granted in the early days. It is argued that the state will lose much revenue if the new cut-off is built because the traffic over that line will not be subject to the old franchise terms. The appeal of the towns on the present line is now before the I.C.C. at Washington.

Scranton mine, located five miles northeast of Marion, **broke its own record twice within one week.** On one day 1,028 dumps, or 2,609 tons of coal, were brought to the surface. In one single hour 180 dumps were hoisted. In eight hours fifty-nine railroad cars were loaded. The mine employs 250 loaders and 118 shift men. The company recently installed new locomotives whose service made this tonnage possible.

Breaking all Central Illinois Records, Peabody No. 6 mine near Springfield hoisted 3,255 tons of coal or more than 6.78 tons a minute one day early in June. This surpasses by 133 tons the record established at this mine May 4. The superintendent of the mine is T. W. MacMurdo. Oney Melkush is mine manager and the work was performed by 435 men actually at work in the mine for the day.

INDIANA

Organizers of the United Mine Workers probably will be sent to Boonville in **an effort to unionize all mines in that section,** according to announcement there. A bulletin received there asserted there are 14 non-union mines, employing about 235 miners, with a production of 1,000 tons per day in the territory. It asserted that the wages paid are 20 per cent less than the union scale.

Damage estimated at $25 000 to $30,000 resulted from a fire at the Riley Coal Co. mine, eight miles from Terre Haute recently. The entire plant above ground, consisting of the tipple, engine room, blacksmith shop and wash house, was burned. The fire had gained good headway when discovered and the lack of means of fighting the flames rendered it impossible to save the property. The origin of the fire is not known. Charles J. Kintz is president of the company owning the mine.

Three miners entombed by a cave-in of The New Coal Co.' shaft near Bicknell June 2, were rescued at 10:30 o'clock June 5, after having been imprisoned for more than 79 hours. The men, beyond showing marks of the terrific strain under which they had been laboring while awaiting the outcome of efforts of the mine rescue team to reach them, were little the worse physically for their experience. Fresh air had been forced into the shaft and food lowered to them through a 2-in. casing which had been bored to the bottom of the pit shortly after the cave-in. The mine-rescue squad's work was slowed up considerably when earth in the new shaft they were digging gave way. In addition they were menaced constantly by the possibility of the hastily made shaft caving in. As the rescuers neared the roof of the mine it was necessary for them to work while suspended from the top of the shaft by ropes.

IOWA

The Red Rock Coal Co., of Des Moines, has taken over the four Lucas County properties of the Central Iowa Fuel Co. and will operate them from the headquarters at Red Rock.

KENTUCKY

The Southern Coal Co., Louisville, on June 1 received a contract to supply 75 cars of western Kentucky nut and slack at $1.80 a ton to the Eddyville penitentiary.

Amended articles have been filed by the **Cassidy Coal Co.**, of Lexington, **increasing the capital stock** from $25,000 to $50,000.

Attacks upon the management of the Lynch mines of the United States Steel Corporation are featuring the **campaign of Judge A. W. Barkley for the nomination for governor.** He is charging that the company maintains the community of Lynch in a condition bordering upon slavery and that the votes of the community are controlled by the company and cast at the company's direction. He would levy a heavy tax upon "foreign" owned coal properties but declares his tax campaign is not aimed at the majority of Kentucky coal owners.

The United Mine Workers' organization for District 19, comprising eastern Kentucky and eastern Tennessee, at a recent convention in Middlesboro **charged the operators of the Harlan and Hazard fields with employing deputy sheriffs** to circulate among the miners and **hunt out union men that they might be discharged.** The convention sent a resolution of International headquarters of the union urging that a strike be ordered in all the non-union mines in District 19 in order to bring the operators to their senses.

MINNESOTA

Receipts of coal at Duluth and Superior docks from the opening of navigation on May 5 to June 1 as compiled by K. A. Scott & Co., Duluth vessel agents were:

Dock	Anthracite	Bituminous
Northwestern	55,200	174,700
Berwind		30,500
Pittsburgh	34,500	240,000
Carnegie	26,600	138,400
Hanna	9,500	81,700
Boston		57,400
Inland		195,700
Clarkson		105,500
Northern	15,600	74,100
Zenith Furnace		93,800
Phila. & Reading		8,300
U. S. Corporation		261,200
Reiss	23,000	100,400
Pursglove		8,600
Lehigh	42,400	
Great Lakes		61,100
Total to June 1	207,600	1,631,400

Bituminous receipts in excess of last year, 1,501,200 tons.

Anthracite receipts in excess of last year, 202,600 tons.

MISSOURI

Governor Arthur B. Hyde has vetoed **the "Mine wash house bill."** The Governor declared that the present wash house law is better than the proposed one. The bill would have required owners and operators of mines where 50 or more miners are employed to construct a suitable wash house, large enough to accommodate all of the men employed. The wash house would have individual lockers for employees, would be lighted and equipped with steam driers, and with at least one shower bath for each 10 miners. Plumbing for hot and cold water under pressure would have to be provided, with a separate room and bath for negroes.

NEW YORK

The contract for furnishing **300 cars of slack coal to the city water works** of Buffalo, 100 cars during this and the two following months, **was awarded to the Queen City Coal Co.**, of Buffalo, on its bid of $1.45 per net ton, on a $2.24 freight rate.

The Bituminous Coal Association of Buffalo has elected J. Q. Clarke and H. B. Alderman trustees, with J. T. Roberts (retiring president), C. F. Westfall and E. T. Bline holding over. From this number, according to rule, Mr. Westfall is elected president, Mr. Bline, vice president and Mr. Alderman, secretary and treasurer.

Dividends declared and awaiting payment, as reported currently in the *Annalist*, include the following coal companies:

Company	Rate	Per.	Pay.	B. Close
Glen Alden Coal				
L. V. Coal Sales.	$2	Q.	July 2	June 14
N. E. Coal & Coke	5%	—	May 31	May 29
Penn. Coal & Coke	$1	Q.	May 10	May 29
Co.	$2	—	June 20	June 1
Acme Coal Mining Co.	20c.	—	June 5	May 26
Cen. Coal & Coke	1¼%	Q.	July 15	June 30
Cen. Coal & Coke pf.	1¼%	Q.	July 15	June 30
Texas & P. Coal & Oil	25c.	Q.	June 30	June 6
T. & P. Coal & Oil	25c.	Q.	June 30	June 6

OHIO

The damage suit brought by the Rice-Hocking Coal Co. against the Carbondale Coal Co. for $303,000, claimed on the grounds that coal lands of the plaintiff had been damaged, **has been settled for $56,000.**

The Dana Coal Co. has been incorporated with a capital of $10,000 to deal in coal and other commodities. Incorporators are Edward Meyer, Charles E. Chamblin, G. Jolly, W. W. Helmholz and J. A. Culbertson.

The Wester Coal & Supply Co. has been chartered with a capital of $50,000 to deal in coal among other things. Incorporators are Hulda Wester, Anna Wester, J. Walter Wester, Ernest W. Wester and George Wester.

OKLAHOMA

Andy McGarry, of Tahona, has been elected president of District 21, United

Mine Workers, according to announcement made by the executive board of the district. The election was held some time ago, but election returns have just recently been canvassed. The election resulted on the first ballot, and it is declared to be the first time in a number of years that a president has been chosen on the first ballot. The district comprises the States of Oklahoma, Arkansas and Texas.

The O. & O. Fuel Co. has been incorporated in Ada, with a capital stock of $750,000, by Orel Busby and Lowrey H. Harrell, both of Ada, and Fred W. Whitney of Middletown, Ohio.

PENNSYLVANIA

Governor Pinchot on May 31 approved the Bidelspacher bill providing for the appointment of a board of examiners to examine applicants for certificates of qualification as mine foremen, assistant mine foremen and fire bosses in bituminous-coal mines. The new law provides that upon petition of the mine inspector of any district the court of common pleas in any county in the district shall appoint an examining board of three persons, consisting of a mine inspector, a miner and an operator or superintendent, all of whom shall be citizens of the state. The miner must have had at least ten years' experience in the bituminous mines of the state and be in actual practice as a miner. Applicants for certificates of qualification as mine foremen and assistant mine foremen shall be citizens of the United States, at least twenty-three years of age and shall have had at least five years' experience as miners or mining engineers or men of general work inside the mines. Applicants for fire bosses' certificates must have had five years' experience also as miners or men of general work in bituminous mines that generate explosive gas. A fee of $2 is to be paid by all applicants and each successful applicant must pay an additional fee of $3 before receiving a certificate.

J. Hayden Oliver, of counsel for the Glen Alden Coal Co., Scranton, said that "passage of mine-cave bills now before the state Legislature will mean that the Glen Alden Coal Co. will no longer repair properties damaged by the company's mining operations. It is a good bill for the Glen Alden Coal Co.," Mr. Oliver continued, "but a poor one for the people. While it will save the coal company thousands of dollars now being spent in mine-cave damage repairs, it will not give the people of Scranton relief equivalent to that now being furnished by the Glen Alden."

Official notice of tri-district convention of the United Mine Workers to be held in Scranton on June 26 says the **purpose of the convention will be to consider and take appropriate action concerning conditions of employment** to become effective after Aug. 31; also to consider basis of representation for future tri-district conventions and such other matters as may properly be brought before the convention. Representatives to this convention will be elected directly by the local unions they represent and shall have one vote for 100 members or less and one additional vote for each 100 members or majority fraction thereof. No delegate will be allowed more than five votes. It is recommended that no local send no more than five delegates.

Governor Pinchot has signed the Williams bill, providing for a survey of the water and fuel resources of the state. The new law creates a power survey board, consisting of the Governor, the Attorney General, the Commissioner of Forestry, the secretary of the Water Supply Commission, the chairman of the Public Service Commission, the Secretary of Agriculture, the Commissioner of Labor and Industry, the State Geologist and a Deputy Attorney General, which is to undertake an outline survey of the water and fuel resources available for Pennsylvania and of the most practicable means for their full utilization for power development. The board also is empowered to recommend in outline a policy which will best secure for the industries, railroads, farms and homes of the commonwealth an abundant and cheap supply of electric current for industrial, transportation, agricultural and domestic use. The Governor is empowered to employ an engineer for the board and fix his salary, but the members of the board will serve without compensation. An appropriation of $35,000 is made, and the board is to report to the 1925 Legislature.

Fire, following an explosion in which six men were burned and overcome by gas, threatened serious damage to a section of the Dorranceton mine of the Lehigh Valley Coal Co. on May 25. At one time it was thought it might be necessary to flood that section of the mine in order to extinguish the flames.

Mrs. Fannie Sellins, organizer for the United Mine Workers, was leading a charging mob of men and women armed with clubs and bricks when she was killed by a volley of shots fired by guards at the plant of the Allegheny Steel Co., according to witnesses for the defense June 7 at the trial of Edward Mannison and D. J. Riley, deputy sheriffs, charged with the murder of the woman union leader. State witnesses had previously testified that there was no disorder at the mine until after the deputies fired into the crowd. R. J. Schrandt, one of the deputies on duty at the time, testified that after a small group of men had been driven back, Mrs. Sellins organized a mob of men and women and led the charge against the line of deputies.

At a meeting of the boards of the Central Pennsylvania Coal Producers' Association and the Association of Bituminous Coal Operators, held in Altoona on June 1, **W. Clark Miller, a prominent Clearfield County lawyer, was chosen permanent umpire to adjust differences** between the operators and the United Mine Workers in the district **arising from the scale agreement.** Mr. Miller succeeds the late Ex-Judge Allison O. Smith. Mr. Miller is not identified with the coal industry.

The Suffolk Anthracite Collieries has issued $1,000,000 first (closed) mortgage 7 per cent sinking fund gold bonds, due in 1938. The Suffolk Anthracite Collieries are being organized to take over the property and assets of the Suffolk Coal Co., including 525 acres of anthracite lands held partly in fee and partly under lease, the property being near Scranton. The mortgage will provide a sinking fund of 30c. per ton on all coal mined and shipped with minimum payments of $67,000 annually to be used to retire bonds quarterly at not above 107½, these minimum payments being sufficient to retire the entire issue at or before maturity.

The American Civil Liberties Union and various affiliated labor organizations are carrying on a determined movement in nearly every state of the country against so-called criminal syndicalism laws, Harry Ward, of New York, president of the union, declared in a "free speech" and "right of public assembly" meeting at Pittsburgh June 3. Many of those who attended the meeting were delegates to the Progressive Miners international committee, which had just ended a two days' conference. **The miners' international formally launched its campaign to force nationalism of the coal industry** and to gain control of the United Mine Workers' organization. The movement, it was said, will be financed by voluntary subscription and a publication will be established, to be known as the *Progressive Miner*, and printed in five languages, to spread the doctrine of mine nationalization and its kindred objectives.

Joseph Williams, of Altoona, inspector of the tenth bituminous inspection district, announced the results of a series of examinations held recently for the positions of mine foremen, first and second grades, assistant mine foremen and firebosses. Twenty-five passed the test for foremen of the first grade, thirty-three for the second grade, twenty-seven for assistant foremen and thirty-seven for firebosses.

A bill which would compel all municipal bodies, councils, school boards and poor boards et al., to file with the clerk of the courts plans and specifications for all proposed public improvements passed the House at Harrisburg and advanced to third reading in the Senate, where it was sent back to Senator Joyce's committee.

Lightning struck the coal tipple at the workings of the Altoona Coal & Coke Co.'s mines at Delaney, Cambria County, six miles west of Cresson on June 2. The tipple was totally destroyed by the fire that resulted, entailing a loss of $11,000. **The tipple will be rebuilt at once.**

The Davis-Fowler mine-cave bills providing for a return of 12½ per cent of the anthracite coal tax to the counties in which it originated and the distribution of this money by two commissions for mine-cave relief and public improvement, were placed on the House calendar June 5. The bills had been held in the Committee on Mines and Mining and Representative David Fowler, Lackawanna, joint sponsor with Senator Davis, of the measures, made the motion that the committee be discharged from further consideration of the bills. **The bills were passed on first reading June 6.**

The Jeddo-Highland Coal Co. is erecting a first-aid hospital at Jeddo for the use of anthracite miners hurt at the operations of the company. It will be equipped with all the requirements for first-aid treatment.

Anthracite companies will be exempt from the provisions of the Armstrong net profits tax bill under amendments adopted by the Senate Finance Committee at Harrisburg June 7. Representatives of the anthracite industry contended that it was unfair to include them in the bill because of the fact that they now pay a capital stock tax and a fifteen mill tax on the market value of coal produced.

A decision handed down by Dr. Charles P. Neill, umpire for the Anthracite Conciliation Board, in the case of a grievance of the locomotive and hoisting engineers of No. 5 colliery of the Susquehanna collieries, near Nanticoke, holds that **all employees who signed the 1916 agreement and are still in the employ of the company must abide by their agreement.** The decision, however, was in favor of a majority of the employees. The contract was signed May 5, 1916, when positions held by some of the complainants should have been considered as nine-hour positions, the occupants of which were working one hour overtime. The positions came under the first section of the 1916 agreement and the new rates should have applied, Dr. Neill holds. It has been established, however, that holders of the positions entered into an agreement with the colliery superintendent that all slope and locomotive engineers and brakemen working on a ten-hour basis prior to April 1, 1916, should be changed from ten hours to nine hours per day, and should be paid for a nine-hour day at the rate established under the agreement of May 20, 1912, for a ten-hour day, subject to an increase of 3 per cent. It was later discovered that this arrangement would not give the men as much as they would receive had they elected to work the nine-hour day under the terms of the 1916 agreement.

TEXAS

V. H. Williams, of San Antonio, and associates have **purchased a bed of lignite** in McCullon County, and will construct an electric power plant there, using the lignite for fuel.

VIRGINIA

The transfer of the offices of the Consolidated Coal Co. from Roanoke to Norfolk is practically completed.

WEST VIRGINIA

The Fairmont-Chicago Coal Co. is about to spend $100,000 more in making improvements to properties recently acquired. Several months ago this company purchased the Chesapeake mine of the Chesapeake Coal Co. as well as about 2,200 acres of Sewickley coal land in Marion County, which will be developed on a large scale. After making the purchase the company expended about $200,000 in erecting additional dwellings for miners and a storehouse, in buying locomotives, installing mining machine and other equipment and in making many other improvements all with the object of insuring a daily output of about 2,500 tons. The latest plans call for the construction of a steel tipple at the Chesapeake mine, near Barrackville, a contract for the construction of the tipple having been awarded to the Pittsburgh Coal Washer company of Pittsburgh. This tipple will be equipped with shaker screens, loading booms, etc., and additional sidings will be constructed to permit the additional loading of prepared coal without delay.

The Reese Creek Coal Co. which was only recently incorporated, has begun the production of coal in the vicinity of Barboursville, on the edge of the Logan field. This concern has a capital stock of $50,000. Approximately 300 acres of coal are under lease and the company also has obtained an option on about 500 acres additional in the same district. Newly elected officers of the company are: F. W. Cline, of Milton, president; Homer Heck, Milton, vice president; Robert J. Lockey, general manager. Directors of the concern are J. W. Cline, Virgil L. Hall, Clyde Harshbarger, James Jackson and Robert J. Lockey.

Operators of the Greenbrier County coal field have joined in defraying the cost of construction of a $60,000 modern school house for children of employees of the various companies in the field. The Greenbrier

field is one of the newer smokeless coal fields of West Virginia.

The Morris-Enochs Coal Co. has just been launched by Charleston people, having a capital stock of $25,000 and with offices at Charleston. Chiefly interested in the new enterprise are S. V. Morris, F. L. Morris, I. F. Sommerville, and L. W. Bowers, of Charleston, and W. S. Enochs, of Ranger.

The Echo Smokeless Coal Co. has been organized by Charleston capitalists, having a capital stock of $50,000. Headquarters of the new concern will be at Charleston. Among those interested in this company are W. D. Guyer, G. O. Stacy, A. S. Guthrie, R. R. Perry and C. A. Brockman.

WASHINGTON, D. C.

Strikes were rife in the northern part of the state for a time after the beginning of the new contract year all without the sanction of district or sub-district officials. It is understood that those who participated in these walkouts were fined as provided in the contract. That has appeared to have had a tonic effect on miners inclined to strike on the slightest pretext, for **there have not been many illegal strikes in recent weeks** in the northern part of the state.

Encouragement of the plan to buy and store coal during the summer months in anticipation of fall and winter needs, not only to overcome the seasonal demand for coal but in order to avoid railroad congestion, is contained in an **appeal made by W. J. Harahan, president of the Chesapeake & Ohio Ry.** Mr. Harahan asks that coal shipments to the Great Lakes be made early in the season.

Fire on June 5 destroyed the tipple and slack bin of the West Virginia Coal & Coke Co. at Junior, in Barbour County, entailing a loss of about $25,000. It is not intended to rebuild at present, owing to general market conditions, but later on a newer and more modern tipple will replace the one destroyed, which had been in commission for the eighteen years. The first may have been of incendiary origin, as some of the mines at Junior are operated open shop, others closed shop. The Junior plant is in the former category but had not been in operation since June 1.

The American Fund for Public Service, known unofficially as the Garland Fund, **has voted $2,000 to the members of District** 17, United Mine Workers, in response to appeals from miners' representatives, who informed the committee that the strikers had been out for fourteen months in Boone and Kanawha counties. In a statement Norman M. Thomas, chairman, and Roger N. Baldwin, secretary of the fund, said that "ordinarily the American Fund does not give strike relief because we regard that as a union function exclusively and because the amounts required are beyond our means. There are, however, exceptional situations when even a little money will help at a critical juncture and when moral as well as financial support means something to men struggling for their rights."

An offering of $1,200,000 Richland Coal Co. first mortgage 6½ per cent serial gold bonds maturing $60,000 on June 1 of each year from 1924 to 1943 inclusive, at prices to yield from 6½ to 7 per cent according to maturity is being made. The proceeds of the issue are to reimburse the company for capital expenditures and to provide additional working capital. The property of the company is located in West Virginia and consists of 7,951 acres of unmined coal lands. Net earnings of the company available for depreciation, depletion, interest and federal taxes for the five years ended Dec. 31, 1922, have averaged $406,298, or five times the maximum interest charges on the new issue of bonds.

The Norfolk Southern Ry. has bought 150,000 tons of coal from three dealers, but the prices paid cannot be made public at this time, according to L. M. Jones, purchasing agent, because other contracts are now pending. The Cabin Creek Consolidated Coal Co. and the Leckie Coal Co. each got 30,000 tons of this order, while the Dixie Splint Coal Co. got 90,000 tons.

Some interesting addresses were delivered at the annual banquet of **the mining extension schools of the Fairmont District held** in Clarksburg during the latter part of May, including those of R. M. Lambie, chief of the West Virginia Department of Mines; Prof. A. C. Callen, of the mining engineering department of West Virginia University; Dean C. R. Jones of the college of engineering; Harold C. Schwarm, president of the Fairmont class; C. K. Brown, of Morgantown, assistant director of the mining extension department; Walter Miller, of Mount Clare; Harold Mason, Carolina; Andrew Henry Shinnston, and state mining inspectors A. L. Lafferty, of Wheeling; C. W. Stuart and Thomas Jarrett, of Weston, and Evan L. Griffiths, of Clarksburg. There were fully two hundred present at the banquet, over which E. W. Laubenstein, of Clarksburg, presided.

UTAH

The Department of the Interior announces that leases of two tracts of coal lands in Utah will be offered at auction at a date to be fixed by the Salt Lake Land Office. The land in question comprises two tracts involving 840 acres and located 40 miles northeast of Richfield.

WASHINGTON

The coal miners in the employ of the Pacific Coal Co., and a number of smaller companies, operating in the Carbonado and Wilkeson coal fields, Pierce County, Washington, **have decided to call off the strike and accept the operators' terms.** The strike which affected some 2,000 men, was called on March 31, 1921, so **it has been in progress for more than two years.** There appears to be some doubt as to whether the operators will take the men back on the terms offered two years ago.

WISCONSIN

John Sweeney, Vice President of the Valiel Coal Co., Milwaukee, **was married** in Chicago on Memorial Day to Miss Grace Fleming. Mr. Sweeney is a nephew of Baron Thomas Shaughnessy, of Canada.

Hereafter the city Milwaukee will purchase its annual coal supply on a basis of estimated heat value. The contracts for the yearly supply will be let about July 15, instead of June 1, as in past years. Contracts will include oxygen content requirements, and contracting dealers must agree to keep on hand at all times a sufficient quantity of coal to supply the needs of the city institution for 30 days.

CANADA

T. M. Grindley Co. is the new name of the organization handling the sale in the Province of British Columbia of the products of the Conveyors Corporation of America, Chicago, Ill. The address of the Grindley Co. is 1158 Homer Street, Vancouver, B. C. The Grindley Company was the western office of Gormans Limited, Edmonton, and operated under that name up to May 1, but after that date Mr. Grindley took over the business, organized his own company and enlarged his selling staff.

Several wage adjustments have been effected by the U. M. W. executives and the officials of Scotia near Sydney Mines, which apply to machine work in narrow places and the handpick men of the Florence Colliery. The machine men have been asked to accept an advance of 10c. on the ton, and the latter class of employees 3c. The U. M. W. local decided to accept the offer under protest and will keep after the company until their full demand is met. The machine runners claim that because of paying a helper a fairly decent wage, they stand to lose themselves on the present rate of wages. All the U. M. W. locals are pressing for more money for datal men.

The Northern Alberta Coal Operators' Association, embracing all mines in the prairie country north of the Red Deer River, **has been organized** at Edmonton with C. W. Leonard, of the Chintook Coal Co., as president, and C. W. Cupples, of the Great West Coal Co. as secretary. The new organization, which represents about 25 mines, will deal with the Canadian Federation of Labor, the charter of which forbids any affiliation with the United Mine Workers of America.

A Dominion charter has been granted the **Price & Murray Coal Co., Ltd.,** head office, Toronto, with a capital stock of $100,000. The provisional directors are: W. W. Vickers, R. P. Locke, D. Magle, R. Hatton and A. Black, of Toronto.

The Toronto Board of Education has contracted for steam coal at an average price of $9.30 per ton, as compared with an average price of $8.90 last year. Contracts have been let for hard coal at $15.50 per ton as compared with $14 per ton last year.

The coal, output of the British Empire Steel Corporation for the month of May, 1923, was 457,125 tons, as compared with 308,439 tons in May, 1922. The total output of the corporation for the five months ending May 31, 1923, was 2,309,143 tons, compared with an output of 1,381,551 tons to May 31, 1922.

According to the report of the City Auditor **Toronto lost 86.3c. a ton, or a total of $6,962.93, on the 8,068 tons of emergency coal sold at $15.50 a ton.** The total amount purchased was 11,630 tons at a cost of $141,913.90. The cost of handling was $48,388.49.

A special commission of five members of the United Mine Workers of America have arrived at Sydney, N. S., from Indianapolis, authorized by John L. Lewis, international president of the U. M. W., **to make a thorough investigation of the affairs of District 26,** which includes all the Nova Scotia coal mines. The commission is instructed to take any action deemed necessary to bring the district back in line with the U. M. W. should it be found that its policies have been radically departed from.

Fire recently destroyed the boiler house and wash house at the North American Collieries plant at Evansburg, Alberta, with an estimated loss of $25,000.

MEXICO

Extensive development operations of the Rosita coal field, near Sabinas, have been started by the American Smelting & Refining Co., which purchased the property some time ago. It is reported that the company will expend more than $4,000,000 United States currency in constructing coke ovens and other improvements. According to the statements of engineers who have been exploring the coal field, there are approximately 100,000,000 tons available for converting into high-grade coke. The output of the coke ovens will go to supply the smelters of the company at Monterey, Asarco, Chihuahua and Aguas Calientes.

Association Activities

West Virginia Coal Association

The annual meeting of the West Virginia Coal Association has been so timed that members may attend it and the annual convention of the National Coal Association. The annual gathering of the West Virginia Association will be at Atlantic City, Tuesday afternoon, June 19, at 2:30 o'clock, when the association will elect directors, who will select the officers of the association for another year. The usual routine business will be transacted and the policy of the association during the convention of the National Coal Association formulated. W. H. Cunningham, secretary of the West Virginia Association, who also is chairman of the convention committee of the national association, is urging all members of the local association to attend both meetings.

Obituary

Harry P. Mahaffey, 45, assistant superintendent of the Wilmore Coal Co., Windber, Pa., died on May 24th, of pneumonia, leaving a wife.

Angus Ralph Crow, widely known in the Ontario (Can.), coal trade, died at his home in Chatham, Ont., where he was for many years engaged in the wholesale coal trade. He was 63 years of age.

James D. James, 60, of Clinton, Ind., who has been in the employ of the Clinton Coal Co. for 27 years, much of that time as mine superintendent, died recently at his home. At the time of his death he was superintendent at Crown Hill mine No. 2.

John M. Manson, 55, secretary of the Deep Vein Coal Co., Terre Haute, Ind., died June 3 at St. Anthony's Hospital, Terre Haute, of injuries received four years ago when his motor car was wrecked by a street car. Mrs. Manson also suffered injuries which caused her death. Mr. Manson apparently had recovered and was active in business until two weeks before his death.

Traffic News

State railroad commissions have no authority to order intrastate rates lower than interstate rates on the same commodities even when the commodities specified are consigned to a governmental agency if by so doing there is a tendency to create a monopoly, according to a decision of the U. S. Supreme Court rendered May 21. The case at issue involved stone and gravel for public road work in Tennessee. The Interstate Commerce Commission in July, 1920, ordered a 25 per cent increase in interstate rates. The Tennessee Railroad Commission ordered similar increases on intrastate rates excepting carload shipments of stone and gravel for use in public highway construction and consigned to the State, a county or a municipality, or an agent of one of these. The railroads appealed to the Interstate Commerce Commission, which directed an increase in accordance with its first order. The Tennessee Railroad Commission applied for an injunction in the federal district court, claiming that preference to government shippers expressly was provided by Sec. 22 of the Transportation Act. Three judges hearing the case declared that discrimination in such a case was not necessarily unlawful, and granted the injunction, whereupon the Nashville, Chattanooga & St. Louis R.R. and other companies appealed the case to the Supreme Court because of the importance of the principle involved. The Supreme Court held that the facts in this specific case made it appear that certain quarries within Tennessee would be benefited by the difference in rates to an extent which would give them practically a monopoly of stone and gravel for use on road work within the state and that under these circumstances a lower intrastate rate was not proper, hence the decision was reversed.

Coal rates from Castlegate, Utah, to Malad, Idaho, on the Oregon Short Line R.R. have been reduced to $2 on slack and $2.60 on other grades. The old rate for all grades was $3.35.

Charges collected on coke in carloads from various points in the United States destined **to Cananea, Mexico, have been found by the I. C. C. not to be unreasonable.** As a result the complaint of the Greene-Cananea Copper Co. has been dismissed.

The Interstate Commerce Commission has **approved a reduced schedule of rates on nut and slack coal from mines on the St. Louis & San Francisco Ry. in Oklahoma and Arkansas** to certain destinations on that line in Texas.

During the last few months **the coal-carrying capacity of the Pennsylvania Railroad System has been increased by what is equivalent to the addition of 2,308 new coal cars** to the service. Last October orders were placed with the railroad's Altoona works to substitute 70-ton trucks for 50-ton trucks under 10,188 cars then operating in the coal service. To date there have been 6,173 cars turned out of the shops with this work completed, their carrying capacity being increased 31 per cent each by the substitution of the heavier trucks. The additional capacity thus obtained is naturally of greater advantage from an operating standpoint than if it had been secured by placing additional cars in service, as there is no corresponding increase in the number of car units to be handled in trains. When these cars were built, 70-ton capacity bodies were placed on 50-ton trucks and the load restricted to 50 tons because of insufficient strength of certain bridges on branch freight lines to carry the heavier loads. The correction of these conditions now makes possible the operation of the heavy equipment, loaded to full capacity. It is expected that work will be completed on all the cars by autumn. When this is accomplished, the coal-carrying capacity of the system will have been increased by 190,516 tons, which is equivalent to placing 3,810 new cars in the service.

The hearing in the case of the Avrshire Coal Co. vs. the Southern Ry., which was assigned for June 30 at Terre Haute, has been postponed indefinitely.

During the month of May **2,622,357 net tons of soft coal and 241,460 net tons of hard coal passed westward through the United States and Canadian canals at Sault Ste. Marie.** Of this amount 19,045 tons of soft coal and 2,100 net tons of hard coal passed through the Canadian Canal.

A report by the Car Service Division of the American Railway Association shows that **on May 15 210,243 freight cars were in need of repair. This was a decrease of 262 compared with the number on May 1.** The number in need of repair on May 15 represented 9.3 per cent of the total number of cars on line compared with 9.2 per cent on May 1.

Authority has been granted the **Virginia Railway Co. to issue $5,700,000 equipment-trust certificates.** This amount will be applied on the purchase of equipment which includes fifteen Mallet superheated freight locomotives to cost $1,208,700; 1,000 120-ton steel flat-bottom gondola cars to cost $5,000,000 and 500 steel 70-ton hopper bottom coal cars to cost $1,477,500.

In order to determine the number of cars to which mines on its system are entitled, **the Baltimore & Ohio R.R. is utilizing the services of twenty-four operators and coal-company officials** as a preliminary step toward rerating mines on that system. C. L. Chapman, for instance, general superintendent of the West Virginia Coal & Coke Co., heads a group which is engaged in inspecting the mines of the Somerset field. It will require in all about seven weeks to complete the preliminary steps toward rerating the mines. Every mine is being visited and its facilities for loading coal inspected. In making such an inspection, information as to the amount and condition of equipment, trackage, height of seam, previous performance, man power and other conditions is all being compiled.

Rates on coal from the mines of the Slogo Coal Corporation at Johnston City, Ill., to various destinations in Michigan, Iowa, North Dakota, South Dakota, Missouri, Minnesota and Wisconsin **are unreasonable,** in the opinion of John B. Keeler, an Interstate Commerce Commission examiner. In a report to the Commission, he recommends that these rates be declared unduly prejudicial to the extent that they exceed the joint rates on like traffic from the mines on the Southern Railway in the Southern Illinois group or the mines on the Baltimore and Ohio Railroad in the Belleville group, by more than the current differential between the Southern Illinois and Belleville group.

Freight rates on coal from the southern and western fields in Colorado to eastern points in the state have been slashed and slight reductions have been made in the rate from the northern fields to Denver by the Colorado Public Utilities Commission. The reduction also means lower rates to eastern points outside of Colorado. Anthracite rates from the western Colorado field reduce the spread between hard and soft coal from $1.18 to 50c. A reduction of 7c. a ton on lump and 9c. per ton on slack and pea from the northern fields to Denver has been ordered. The prevailing rate was upheld between the southern field and Denver. Substantial reductions were ordered in the rates between the southern fields and eastern Colorado. Rates from southern fields and the Canyon City district to Greeley and other Weld County points were cut from $3.40 on lump and $3.15 on nut to $3; on pea and slack from $3.03 and $2.93 to $2.70. Trinidad carries a differential of 25c. on lump and nut and 10c. on pea and slack over the Walsenburg tariffs. The present charge of $2.25 from the southern fields to Colorado Springs was lowered to $2. The rates to Pueblo and Denver, $1.76 and $2.34, were declared reasonable basic rates. Rates to Cheyenne Wells, on the Union Pacific, will now be $3.90, almost $1 lower than the old rate. To Kumer the new rate will be $3.05, and to Fort Morgan, $3.20. On the Colorado & Southern the rate to Fort Collins and adjacent points will be $3. It is ordered that shipments east of Denver must bear rates not exceeding by more than 50c. those on Walsenburg shipments. The order applies to the Union Pacific, Colorado & Southern, and C. B. & Q. railroads. A differential of $1.20 is allowed on the Rock Island line.

April net railway operating income on Class 1 railroads totaled $83,197,800, representing a return, on an annual basis, of 6¼ per cent of the Interstate Commerce Commission's tentative valuation, according to a statement by the American Railway Association. In April last year the same carriers reported a net operating income of $49,979,000, equivalent to 3.99 per cent on the tentative valuation, while the net operating income for March this year was $83,487,000, or 5.96 per cent. The April rate of 6¼ per cent is the highest return earned in any months since the passage of the Transportation act of 1920. Operating revenues in April were $522,955,700, an increase of more than 25 per cent, compared with the same month of last year. Operating expenses totaled $403,869,000, an increase of more than 20 per cent over the same month of last year.

The report for the Lehigh Valley R.R. for the year ended Dec. 31 shows that the company carried 23,071,515 tons of miscellaneous freight as compared with 26,377,743 tons in 1921. E. E. Loomis, president of the company, says in his report that the year 1922 will be remembered in history, from the standpoint of the railroads at least, because of the serious and continued difficulties with union labor. The miners' strike, he says, not only tied up anthracite production, but forced a considerable reduction in bituminous operations, reduced transportation earnings, and the higher price for bituminous coal greatly increased operating expenses. The strike of the shop-craft employees had its effect upon practically all carriers. Mr. Loomis says that upon the ending of the miners' strike the company concentrated its efforts upon the handling of fuel, and was able to furnish a full supply of cars at the mines served by its road every day after the resumption of mining, with the result that the anthracite loadings up to the end of the year amounted to 4,139,014 tons, an increase of 758,375 tons over the same period in the preceding year.

Coming Meetings

Iron and Steel Exposition at Buffalo, N. Y., Sept. 24-28. Association of Iron and Steel Electrical Engineers, Empire Building, Pittsburgh, Pa.

National Retail Coal Merchants' Association will hold its sixth annual convention June 25, 26 and 27 at Scranton, Pa., with headquarters at the Hotel Casey.

National Safety Council will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

International First-Aid and Mine Rescue meet will be held Aug. 27-29, at Salt Lake City, Utah.

American Institute of Electrical Engineers will be held Aug. 27-29, at Salt Lake City, Utah.

American Institute of Electrical Engineers will hold its annual convention June 25-29, at Swampscott, Mass. Secretary F. L. Hutchinson, 29 West 39th St., New York City.

American Society for Testing Materials will hold its annual meeting at the Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., beginning June 25 and continuing throughout the week. Secretary, E. Marburg, Philadelphia, Pa.

The Colorado & New Mexico Coal Operators' Association will hold its annual meeting June 20 at Denver, Col. Secretary, F. O. Sandstrom, Denver, Col.

National Coal Association will hold its sixth annual convention June 19-22, at Atlantic City, N. J. Assistant secretary, C. C. Crowe, Washington, D. C.

The American Institute of Mining and Metallurgical Engineers has accepted the invitation extended by the Ministers of Mines of Ontario and Quebec and by the Canadian Institute of Mining and Metallurgy to hold its autumn meeting in Canada. The meeting lill start Aug. 20 at Toronto and end Aug. 30 at Montreal. Secretary, F. F. Sharpless, 29 West 39th Street, New York City.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.

The American Mining Congress will hold its twenty-sixth annual convention in conjunction with the **National Exposition of Mines and Mining Equipment,** Sept. 24-29, at the Milwaukee Auditorium, Milwaukee, Wis. Secretary, J. F. Callbreath, Washington, D. C.

Ninth National Exposition of Chemical Industries at the Grand Central Palace, New York City, week of Sept. 17. Manager, Charles F. Roth, Grand Central Palace, New York City.

West Virginia Coal Association will hold its annual meeting Tuesday afternoon, June 19, at Atlantic City, N. J. Secretary W. H. Cunningham, Huntington, W. Va.

Mine Inspectors' Institute of America will hold its 13th annual meeting July 10-12 at Pittsburgh, Kan. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa.